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H. H. SNELLING, EDITOR.



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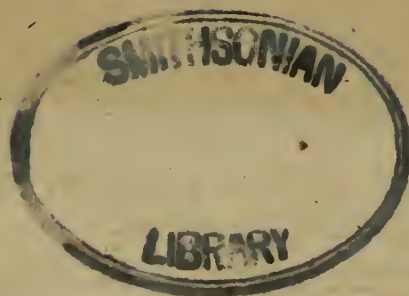


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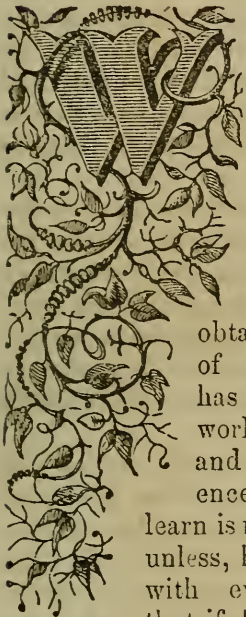
PHOTOGRAPHIC ART-JOURNAL.

Vol. 6.

JULY, 1853.

No. 1.

REMARKS IN RELATION TO PHOTOGRAPHY UPON METALLIC PLATES.

From the French of Saint Germain-en-Laye, by J. R. Snelling, M. D.

WHILE engaged for some years with photographic processes and the condition of electro-chemistry, relating to it,—as for example the deposits of a coating of silver chemically pure upon plates which have been used before to obtain proofs or which are of a bad quality,—which has sometimes marked the works which I consulted; and as I know by experience that he who wishes to learn is not sufficiently gratified unless, he be made acquainted with every detail, I thought that if I spoke of the experiments which I have made, I would endeavor to leave nothing in the dark, but dwell particularly upon the numbers, the dimensions, the feet and thousand little nothings which are so often neglected; you will understand therefore why I explain, perhaps too minutely, in the notes that follow, even those matters which are easy to divine or lay hold of.

Nevertheless, I do not write except to yield to the solicitations of several persons, who have for a long time urged me to the task. They induce me to hope that I may render myself useful to some amateurs, and especially beginners, who prefer a kind of natural practice and very detailed, to the very uncertain theories, which I would not be able to give them.

If it were not thus, I would have at least verified whereabouts photography was in 1850. Is it not easy to foresee, that it will

soon have had its day, and that its rival on paper is destined by indispensable advantages to steal a march upon it?

The foregoing remarks are somewhat similar to the first edition of this pamphlet, which Mr. Roset delivered to the public the same day, I think, in which I received orders to repair to Toulon and embark for the Pyree. I could not fail to add to my luggage a complete apparatus, and in the 15 or 20 days which I was enabled to spend in Greece, I fixed upon plate the image of the admirable monuments which enclose the Acropolis.

The proofs obtained by the processes to which these notes refer are presented to amateurs and artists to whom I have been happy to show them, with a vigor and a clearness, which encourages me to again recommend to those engaged in photography, these same processes, which Mr. Roset at present requests me to describe a second time.

SAINT GERMAIN-EN-LAYE.

July 15, 1850.

OF THE PLATES.—Those who have practiced the daguerrotype art know how difficult it is to find good double or sheeted plates, and that it is almost impossible to make a good proof upon those which have already been used several times, especially if they have been submitted to the chloride of gold. Accordingly, for more than four years, I have resorted to the means of silvering mine by electro-chemical processes. I have found two real advantages to follow this method; the first was to render useful a very great number of plates, which would not otherwise suit my purpose, and the second was to obtain in my preparations

a greater sensitiveness to the action of light.

The following two experiments I have repeated frequently and they have always given me the same results.

I have taken a silvered plate, as fine as possible, silvered one-half of it by means of the pile, polished the whole plate in the usual manner, and already, after this first preparation, I have observed that the silvered side presented a darker and deeper aspect than the side which was not. I have observed the iodine and bromine with this plate strictly under the same circumstances; I have made a proof with it, and the side of the galvanic deposit was more clear, warm and more harmonious than the other.

The second experiment is as follows; a proof made likewise upon a prepared plate as the preceeding, gave me the following results: the new side was well developed and might be considered as quite a good proof. The silvered side was overdone and received consequently too much light.

Every one will infer from these two facts, repeated quite often, the same conclusions as myself. The sensitive coating formed upon the silver chemically pure thus deposited upon the plate, is much better than that prepared upon the silvered plate itself.

To these advantages I have to append a third, inasmuch as Mr. Rochaz of Lyon, has conceived the happy idea of slightly silvering his plates for every proof that he makes. It is evident that by proceeding as he advises, he always operates in almost identical conditions, which is of unquestionable utility in photography.

I do not therefore at this time use any other than my old plates, and were I obliged to purchase new ones, I would plunge them into the silver bath, even before making the first proof.

POLISHING OF PLATES WHICH WE WISH TO SILVER.—Remove the image as usual, with rottenstone or pulverized pumice-stone, and with the acidulated petroleum oil, if the proof has been submitted to the chloride of gold, or with alcohol mixed with a fifteenth part in iodine of ammonia and a little less of sulphuric ether, if it has not been fixed; but before giving the last polish, dry it well with the powders used

in photography and the cotton or polishers. Then place it upon the iodine box until it acquires a blue or violet tint. If the image has not been completely effaced it will reappear upon several points. In the contrary case, you will not perceive any trace of it. Polish again, if necessary, or remove merely the coating of iodine, then burnish it precisely the same as if you wished to use it for making a proof; but clean carefully the edges and the small creases formed by the pincers, because the particles of dust or the asperities which may exist would derange the electric current in the bath, and you see formed behind them, and always perpendicularly, from top to bottom, the deep lines where the silver has not been deposited, and which are less distinct according to the increased distance from the small obstacle which produces them.

The proof with iodine is the more indispensable, because if you plunge into the metallic bath a plate from which the image has been imperfectly effaced, this will reappear when the silver acquires a certain thickness, and it will then be necessary to remove it anew, and lose consequently both time and metal.

It is useless to silver an old plate which is worn through or cut, so as to expose the copper and produce slight cavities. The plate would polish without doubt; the proof taken upon it would be developed upon every point; but the holes, the streaks, and the fissures would never disappear, and would be so many defects contributing to spoil the whole of the image.

We might still planish perfectly the plates of copper over which we could deposit a coating of silver; this is an experiment which I have not tried, but samples have been laid before me manufactured from these plates in the shops of Mr. Christophle, which have given me very fine proofs.

VARNISH USED TO PREVENT THE SILVER FROM BEING DEPOSITED UPON THE BACK OF THE PLATES.

If a double plate were plunged into a bath, without the copper side being preserved from all contact with it, it is evident that it would be silvered upon the two faces, and double the expense would be thus incurred than what is necessary. The back

of the plate must therefore be covered with a kind of plaster that cannot be attacked by the cyanides, and of a nature, consequently, which does not change them. Here is one, I think, which combines nearly these qualities and which has resisted, at least for a certain time, with the proofs that I have made.

Take *Copal varnish*, such as all painters sell under that name, and pour it into a little cup about the size of a Bordeaux wine glass. Then with a flat brush triturate in this varnish two cakes of chromate of lead, each of the size of a filbert deprived of its shell. The varnish will thus become a little thicker than it was, and of a yellow color. Apply with your flat brush, a coating upon the back of the plate, just in the same manner as if you were varnishing a table, but do not go quite to the edge. Put the plate on a very even table, and let it dry for twenty four hours. At the end of this time, the varnish may be plunged into the bath with impunity.

There is no need of removing the varnish after making a proof. Fixation can be effected with the chloride of gold, in the same manner as if the plate were bare. I have had occasion to submit the same plate two or three times to the chloride, and silver it fifteen or twenty times in succession, without affecting the coat of varnish. It does not change so promptly as if it had been in contact with the silver bath before being perfectly dry.

If you wish it to become hard in a little time, heat the plate in the flame of a spirit lamp, as soon as you have varnished: the heat will soon inflame the copal; extinguish it immediately, and put the plate upon an even surface.

If any marks are made with the finger, you may put the plate in the bath, apply the varnish over it, and all trace of the marks will be removed.

MODE OF SUSPENSION IN BATH BY MEANS OF HOLES MADE THROUGH THE PLATE.

Whatever may be the size of the plate, make a small hole in three of its corners. The punch or gimblet which you use, should be applied upon the side intended to receive the silver, so that the elevations of copper produced by the punch may be on the opposite side of the plate. Remove these irregularities with a soft file.

These three small holes, of about the thousandth part of an inch in diameter, are not only indispensable for suspending the length and breadth of the plate in the bath, but also for keeping it parallel with the soluble *anode* in front of which it is to be placed. If it were only held by one point, it would turn upon the least motion of the liquid, and the side which approached the *anode* would acquire a thicker coating of silver than that which was more distant.

RECAPITULATION.—Whether your plate be new or old beat down the edges to facilitate the action of the polishers.

Flatten the four corners so that they may be placed under the buttons of the holder to polish.

Punch a hole in three of these corners and at the centre of the small flat surface which is to be made.

File off the *bavures* from these holes.

Varnish the copper side, and let the varnish become perfectly dry.

Erase the image, if there is one, and polish the plate as carefully as if you wished to make a proof.

The plate will then be ready to put into the metallic bath, and I will also show how the plate (after having received a coating of silver which gives it a beautiful cream white tint) must be prepared so that it may readily absorb the substances which render it impressible to light.

PREPARATION OF THE SILVER BATH.

The proportions which I am about to point out here serve to compose $1\frac{1}{2}$ pts. of liquid in which we plunge the plates to be silvered. These proportions will consequently be doubled if we wish to have three pints, and so in order.

In a chimney which has a good draft, or in the open air, place an apparatus consisting of a common basin, such as is used for washing the hands, for example, and at the bottom of this basin, put a small tripod sufficiently high to support a glass retort above a spirit lamp.

Into this retort, which ought to be ten or twelve centimetres in diameter, put ten grammes of pure silver, cut into very small pieces or strips. Pour upon this silver forty grammes of pure nitric acid. Place the retort on the tripod and light the lamp below it, taking care at the com-

mencement, not to give too much intensity to the flame, such as would be liable to crack the retort. The basin is merely designed to receive the silver liquid in case the accident referred to should take place. The retort is immediately filled with reddish vapors, dangerous to respire, and which are disengaged in abundance. The acid soon enters into ebullition; give then a little more activity to the flame and let the acid boil thus for half or three quarters of an hour, a time sufficient for the ten grammes of pure silver to become almost completely dissolved; which will take place the quicker, in proportion to the small size in which the pieces of silver shall have been reduced or cut, and the frequency with which you shall have stirred the acid, by raising the retort by the neck, and giving it a slight rotary motion. The fumes set free at this moment will be almost colorless and not very abundant, and no trace of silver will appear in the liquid. Pour then what the retort contains into a small porcelain capsule with a nose to it, and put over the flame of the lamp, in the same manner as with the retort, in order to evaporate all the liquid. This operation is nearly as slow as the first. By degrees the liquid thickens, white crystals appear at the edges, and a pellicle forms at its surface. The whole mass being perfectly thickened, and all evaporation having ceased, there remains at the bottom of the capsule twelve or fifteen grammes of a white salt in confused crystals, which is no other than the nitrate of silver; but during this second operation, it will be necessary to stir constantly with a strip of glass what is contained in the capsule, even after the salt ceases to disengage the least vapor. This precaution is necessary to prevent the nitrate of silver from sticking to the bottom of the vessel, and acquiring a slate color which would quickly pass to the deepest black. Carefully avoid touching the nitrate of silver with the fingers, or letting it drop upon the clothes, for it stains all organic substances of an indelible black.

If the silver which you dissolve is pure, no green tint will be produced during the evaporation of the liquid; if, on the contrary, (which almost always happen) this silver contains copper, we will see the crystals which commence to form assume a very decided greenish color, but which

will almost disappear when the salt shall have lost its moisture.

If the silver is pure, if I do not perceive any tint making known to me the presence of copper, I melt twelve or fifteen grammes of nitrate of silver in half a litre of distilled water, contained in quite a large decanter sealed with emery, and I dissolve at the same time in another bottle, (in which I also pour half a litre of distilled water) 10 grammes of the white cyanide of potassium for every gramme of pure silver which I have converted into nitrate, that is to say 100 grammes, seeing that there are 10 grammes of silver reduced by the nitric acid.

The 15 grammes of nitrate of silver are almost instantly dissolved in the half litre of distilled water, the 100 grammes of cyanide of potassium melts no less quickly in the other half litre of distilled water which acquires a dirty brown tint; then pour a small quantity—half a tumbler full for instance—of the solution of the cyanide of potassium into the solution of nitrate of silver. That which was clear and limpid, save perhaps a slight milky appearance, is presently filled with very abundant large white and broken flakes; the bottle which contains them must be agitated briskly, by adding always by little and little the rest of the cyanide water; the white precipitate soon diminishes and disappears when the two *demi-litres* of distilled water mix together. However, if the precipitate were not completely dissolved after this mixture, it would be necessary to add directly to the liquid several grammes of cyanide of potassium, and stir it until it is dissolved, and the white or brown flakes disappear at the bottom of the vessel; you then filter through paper, and obtain a perfectly clear liquid slightly colored of a golden yellow and ready for use; this is a litre of the bath of silver composed of a double cyanide of this metal potassium.

Admitting the second supposition, that the silver contains copper—the presence of which is indicated by the green color of the salt and the liquid—you will proceed in the following manner:—

Dissolve 15 grammes of this nitrate of silver in a large bottle sealed with emery;* then drop gradually into this solution, a

* *i. e.* Having a ground stopple.

small quantity of water saturated with common salt and well filtered; a Madeira wine-glass full would be more than sufficient. At the moment when the saline water touches the silver solution which was limpid, or which presented perhaps the appearance of whey not clarified, it is filled with thick flakes, very abundant and of an extreme whiteness; shake the bottle briskly adding several drops of distilled water and let it settle for ten minutes, taking care not to put the bottle in a very light place, or covering it with some black material; because this white precipitate would change in a few minutes to violet, then to black, in case it were struck by a too vivid light from the window. The white precipitate collects at the bottom of the bottle, and the superincumbent liquid becomes limpid. Then pour 25 or 30 drops of saline water into the bottle; if they do not slightly whiten the part upon which they fall, continue to pour in; but if they still produce an abundant precipitate, add anew, stir the whole briskly in order to let it again settle for some minutes and always in a dark place.

It is easy to see that this operation is for the purpose of showing us whether all the silver contained in the liquid is combined with the chlorine of the common (marine) salt to form this white precipitate insoluble in water, which is nothing else than chloride of silver.

As soon as the salted water ceases to yield the precipitate, decant the liquid carefully by slightly tipping the bottle, so that the water may flow without carrying off with it a part of the deposit. Replace what you pour off by fresh water, shake it vigorously in order to wash well the chloride of silver again, let it settle, decant a second time, replenish the bottle with fresh water, shake it briskly and let it settle.

All these washings having carried off almost entirely the nitrate of copper and other substance which the solution contained, you will replace finally the water of the third washing by *little less than a litre* of distilled water. Then weigh 100 grammes of cyanide of potassium, either in powder or in pieces, and commence by putting a quarter of it directly into this litre of water at the bottom of which is the white precipitate, shake the bottle until the cyanide is dissolved; then add the half of

what remains of the 100 grammes, again shake, and so on in succession until the precipitate which shall have taken a brown tinge, is completely dissolved. You will then have a liquid of a dirty color, but in which neither the cyanide or chloride of silver can be perceived. Filter through paper and by the light which is most convenient, and you will collect nearly a litre of a limpid liquor, having a slight golden yellow tinge and which will be ready for use. This will be also a litre of a double cyanide of silver and potassium.

If, before filtration, the cyanide of potassium were not sufficient to entirely dissolve the salt of silver, there would remain in the liquid flakes, of a dirty brown color and forming quite an abundant deposit at the bottom of the vessel. You will afterwards filter.

These baths of silver stain animal and vegetable substances, and set free a certain quantity of cyanogen which it is prudent to guard against. It is necessary also to avoid touching the liquid with the hands, especially if there be any cut or excoriation. Suffice it to say that there enters into the composition of these baths a sufficiently large quantity of prussic acid to require handling with the greatest care, and that the tubs which contain them be placed outside of the house, in the open air, if possible, where they will lie excluded from the wind; my tubs are arranged and covered with ground glass which prevents all evaporation.

GALVANIC BATTERIES.

I have for some time given up the simple pile, which may however answer a good purpose, especially for plates of small size. It consisted of a vessel of porcelain or crystal glass from 12 to 15 centimetres in height and 10 to 12 in diameter, into which I have poured the silver bath. I plunged into the centre of this bath a hollow cylinder, made from an earthen pipe, and forming a diaphragm which I filled with water saturated with common salt at 15 degrees of the hydrometer. I gave the same level to the two liquids in contact with this diaphragm. I attached the plate which I wished to silver to one of the extremities of a red copper wire, half a millimetre in diameter and from 25 to 30 centimetres in length, and I fastened it by

means of a small hole made in one of its corners. At the other extremity of the copper wire, I attached in the same manner a piece of zinc presenting an even surface nearly half that of the plate. I first put the zinc in the salt water contained in the diaphragm, and then at a single dash, I plunged the plate into the silver bath, the varnished side turned towards the porous tube. I thus placed in my apparatus as many pair--copper and zinc united by copper wire—as it could hold, and I obtained very good results. But there existed in this method of procedure difficulties easy to comprehend. The silver bath changed by its contact with the salted water through the diaphragm. This porous tube carried off also part of this silver liquid by absorption. Finally, the bath soon became impoverished, and frequently failed to recharge, an operation always slow and delicate.

I have thought that it would be better to use a single battery; a tub for the decomposition and a soluble *anode* which, rendering immediately to the bath the metallic silver taken up by the plate, would thus always maintain it at the same degree of saturation. I have tried almost all the piles described by authors, and have adopted that of Professor Daniel with some modifications which is much more simple for use.

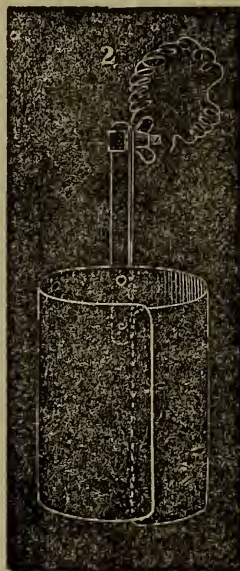
It is composed, as we are aware, of two metals, zinc and copper, the first of which is plunged into water feebly acidulated with oil of vitrol, and the latter into a saturated solution of sulphate of copper. These two liquids are separated by a porous diaphragm designed to prevent their mixture, without preventing however the passage of electricity from the zinc to the copper through the liquid. This pile, modified to suit the taste or necessities of the operator, but always based on the same principles, is easy to prepare and clearly perfectly fulfills the object we have in view.

I arrange the one which I make use of in the following manner: I take one of those glass jars, known under the name of jelly jars, selecting it of 21 centimetres of interior height, and 13 in diameter (See Figure 1.) I cut out a copper plate 15 centimetres in height, and sufficiently long that (when rolled upon itself, so as to have its two extremities overlap a little,) it may

form a cylinder which lines the jar to a



certain height, (Fig. 2.) Being prepared, it will then be 15 centimetres in height by 39 in circumference, and a little less than

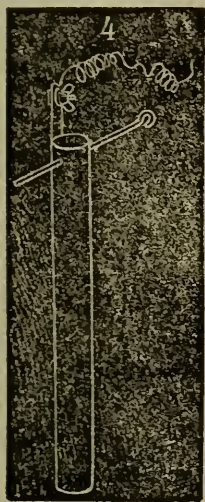


1 millimetre thick. I make a small copper gallery 5 centimetres high by 12 of exterior diameter and 9 of interior



diameter; figure 3 will make it easily un-

derstood. It is intended for crowning the copper cylinder and prevent the fall of the crystals of sulphate of copper into the water saturated with this salt, with which they are in contact by the numerous small holes made in the floor of this gallery. We remove it when we wish, and with it all the crystals which it contains, thereby rendering the cleaning of the pile extremely easy. An opening is made upon its circumference, to permit the passage of the wire of the coiled sheet.



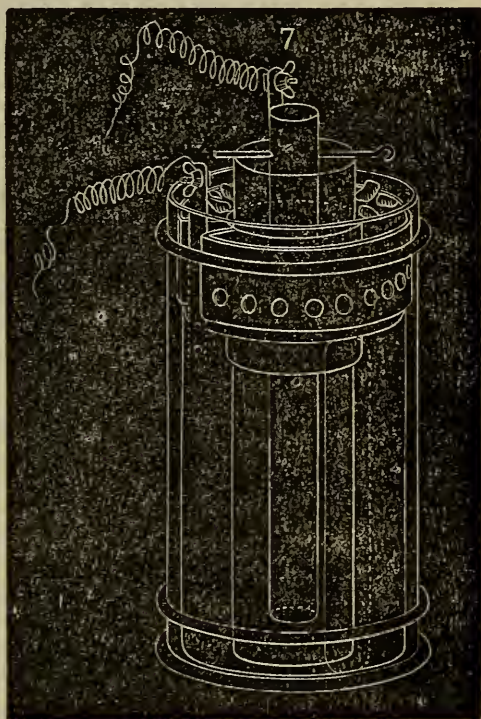
I cast a rod of zinc 3 centimetres in diameter, (fig. 4.) and pierce it through in a part 2 centimetres from one of its extremities; in order that it may be suspended by a copper cross bar on the rim of the diaphragm. The zinc and cylinder of copper will necessarily have an appendix sticking out and perforated with holes, to which we may; by means of a small screw (fig. 6.) fasten the

wires for conducting the electricity. The appendix riveted to the sheet of copper should be long enough to reach 2 centimetres beyond the edge of the jar. I place in the glass jar the sheet of rolled copper, and at the top of the cylinder which it forms, I adapt the small gallery of which I have spoken and which should be previously well supplied with the crystals of sulphate of copper. It ought not to extend beyond the edge of the vessel; then at the centre of this double apparatus I put an earthen cylinder half burned, shut at the bottom and being 25 centimetres high by 8 or 8½



of exterior diameter (fig. 5.) I then suspend in the diaphragm the rod of zinc which I have first amalgamated. I fill the same diaphragm with water slightly acidulated with pure sulphuric acid (about 30 or 40 drops will suffice,) and I pour into the jar water saturated with sulphate of copper in the small gallery. The level of the two liquids separated by the

thickness of the diaphragm ought to be nearly the same, allowing however, to the acid saturated water in which the zinc is suspended, a centimetre more in height. I fasten to the appendages of the sheet of copper, and the rod of zinc the wire conductors of copper being less than one-half millimetre in diameter with a length of 50 centimetres for the wire of the copper pole, and one metre for that of the zinc pole. In the first place I wind these conductors around a glass rod 5 millimetres in diameter, which serves to mould it and render it very portable. I have thus made the copper wires spiral and flexible and consequently more convenient. The conductor which proceeds from the copper communicates with the decomposition trough by means of a brass rod, from which a plate of pure silver or soluble anode is to be suspended; and the conductor proceeding from the zinc is connected with the plate suspended in the metallic bath which is to be silvered. Figure 7 represents the pile ready for action so soon as the two spiral conducting wires shall be put in contact.



A single element, that is to say a single pile—a single jar thus prepared—is sufficient to silver plates of small size; but it is rather slow for operating with advantage upon large plates. I employ for the latter, which I use almost exclusively, two piles such as I have described, and thus I

have a battery which acts all day without intermission. When we employ two elements instead of one, it is always the conductor from the copper of the first pile which communicates with the soluble anode, the wire fastened to the zinc being connected with the copper of the second, the zinc of which communicates with the plate which we silver.

I obtain with this small battery a very beautiful plating, commencing to present a bluish tint, which passes at the end of three quarters of an hour to a fine cream white tone, leaving perceptible, as by transparence, the burnish which I have given the plate before plunging it in the bath.

There is another pile of greater simplicity. Take any vessel of glass, fine crockery, earthen-ware or porcelain, and which shall be about 14 centimetres high by 8 or 9 in diameter, and fill it with three quarts of the pulverized stone which is used in kitchens for cleaning copper utensils. Thrust perpendicularly into this sand, and to the bottom of the vessel, two strips of equal size, one of copper, and the other of zinc, being 16 centimetres long by 8 in width and 3 or 4 millimetres in thickness. Place them parallel with each other 3 centimetres apart, and pour upon the sand water saturated with sal ammonia and filtered, but in such a manner that the water will not rise *above the sand* which absorbs it. Fix as usual to the two elements of (copper and zinc of this pile) the copper wires, and make the conductor attached to the zinc communicate with the plate to be silvered, and that of the copper pole with the soluble anode in the decomposing cell. Fig. 22 represents this small apparatus.

This pile is energetic and its action is prolonged several days; but it is troublesome, because the two metallic plates oxidize and quickly spoil. Above all the copper is soon covered with a green coating passing to blue which is a violent poison and which must consequently be handled carefully.

We also obtain excellent results by soaking the sand of these small piles with water acidulated by sulphuric acid and in marking 5 degrees to the acid measure. I use them at present with success, and of all those which I have tried, these are cer-

tainly the most economical, the most easily made put in action, and keep perfectly good.

A small battery of three elements answers for silvering large plates; its action lasts several days, but I prefer to clean them in the evening and renew the sand acidulated water every morning.

The sand does not change and it may be employed indefinitely, by washing it and letting it dry every time it is used. In regard to the zinc, it ought to be carefully amalgamated.

PRECAUTION TO BE TAKEN WITH THE PILE WHEN IT IS NOT IN ACTION.

Unfasten the two wire conductors from the two rods which are attached to the decomposition trough.

Remove the zinc rod and wash it with a stiff brush or coarse sponge, to free it from the oxide which forms upon its surface in a greater or less quantity. Take away the diaphragm which dips into the solution of sulphate, turn out the acidulated water that it contains, fill it with fresh water and let it soak all night; the next day you may empty and dry it.

The sheet of copper and the small gallery with crystals may remain undisturbed eight days or a fortnight; but at the end of this time, it will be well to scour with sand the internal surface of the cylinder formed by the coil of zinc. The small gallery requires less care.

In regard to the pile put in action by the water saturated with salammoniac, it will be sufficient to wet the sand anew when it becomes too dry, and it will be necessary to replace the elements, copper and zinc, when they become completely destroyed.

SOLUTION OF SULPHATE OF COPPER.

Nothing is easier than to prepare beforehand the saturated solution of sulphate of copper; put seven or eight hundred grammes of these blue crystals into a stone pitcher, and pour upon it four or five litres of water. After a few hours, the water will contain all the salt which it can hold in solution, and there will remain at the bottom of the vessel a sufficiently large quantity of crystals to replace for a long time the losses which the liquid may sustain.

METHOD OF AMALGAMATING.

The amalgamation of the zinc is for the

purpose of preserving it from rapid destruction in the water acidulated by sulphuric acid. It has also the advantage of rendering the action of the pile less energetic, and that yields a deposit of silver more regular and more adherent. It is very important to know, that the electric current has almost always too much action, and the greatest number of accidents occurring in *galvanic-plastic* proceed from this excess.

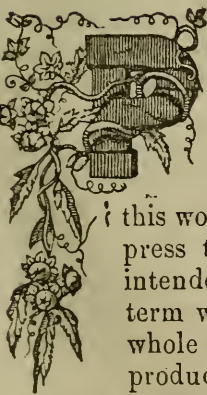
The most simple method of covering the zinc with mercury is as follows: Take two common saucers, in one of them put two or three spoonfuls of pure water, ten or twelve drops of sulphuric acid and a globule of mercury of the size of a small pea. Having a piece of old sponge, wet it by slightly touching it to the acidulated

water, and rub with it the whole of the zinc rod which is to be amalgamated. This operation takes off the verdigris and prepares it for receiving the mercury. Then place the zinc rod perpendicularly in the other saucer and pour *against* it what liquid is contained in the first saucer. Part of the mercury running over the zinc, will stick fast, and the remainder drops into the empty saucer. Spread with the sponge the mercury which adheres to the zinc, and repeat the same operation until all its surface acquires the liveliest brilliancy. Then wash it freely with water and dry it with a coarse cloth. I amalgamate the zinc anew when it has been used two or three times.

(To be Continued.)

From the Illustrated Magazine of Art.

PHOTOGRAPHY.



PHOTOGRAPHY means writing or delineating by light. It is derived from two Greek words, *phos*, light, and *grapho*, I write.

Some have argued that this word does not accurately express the nature of the art it is intended to designate; that the term would be applicable if the whole of a ray of light acted to produce the effect; but as the researches of science have shown that only one part of the sun's rays is called action in the exercise of the art, it would have been preferable to have employed the term *heliography*, written or delineated by the sun. This word was first employed by M. Niepee, one of the original discoverers of the process; but the employment of the term *photography* has been sanctioned by use, and is now universally received and adopted.

Photography is certainly one of the most important discoveries of our age. In relation to physics and chemistry, it has

already been the means of elucidating many points which had not been investigated, or which were but imperfectly understood. In reference to optics especially it opens a large field of research and discovery. Had Newton been acquainted with the properties of light which are developed in the phenomena of photography, there is no doubt that he would have left a more complete theory of light, and of the various rays which compose it.*

Light, if admitted through a small hole in the shutter of a darkened room, will form a white spot on the place on which it falls. If a triangular prism of glass be placed on the inside of the shutter, so that the beam of light must pass through it, on leaving the glass it no longer retains its old characteristics, but forms an oblong printed image of seven colors—red, orange, yellow, green, blue, indigo, and violet. This is called the solar spectrum. Sir Isaac Newton was the discover of this important fact. The experiment is easily made and easily understood. White light is a bundle of colored rays united together. In

Passing through the prism the bond of union is severed, and the colored rays assume an independent and separate character. Seven colors being observed in the spectrum, many believed, and Newton among the rest, that there were seven rays of colored light. This was a mistake. Sir David Brewster, in his experiments, proved that these seven colors were occasioned by three primary rays; namely, the red, the yellow, and the blue. These rays are concentrated when each primary color appears most vivid, but each spreads more or less over the others, the mixture of red and yellow giving orange; of yellow and blue, green; of red and blue violet.

The experiments of Dr. Herschell have established the fact, that each ray of light does not contribute its proportionate share to the intensity of the heat which is produced by the concentration of the sun's rays in the focus of a burning-glass. Formerly it was imagined that each ray communicated the same heat; the advance of science has taught us that this theory is fallacious. Dr. Herschell says, that in a variety of experiments which he occasionally made relating to the method of viewing the sun with large telescopes to the best advantage, he used various combinations of differently colored darkening glasses. What appeared remarkable was, that when he used some of them, he felt a sensation of heat, though he had but little light—whilst others gave him much light with scarcely any heat. Now, as in these combinations the sun's image was always differently colored, it occurred to him that the prismatic rays might have the power of heating bodies very unequally among them. The experiments which he made consisted of passing each ray through an opening in a piece of pasteboard, and placing delicate thermometers, with blackened balls, so that they could be irradiated with each particular color. The result of these investigations proved, that the red rays possessed a greater amount of heating than those of any other color; that the violet rays communicated the least.

Previous to these investigations it was known that light produced a blackening influence on paper moistened with a colorless solution of nitrate of silver, and the discovery of Herschell brought about the inquiry, whether the greatest amount of

chemical effect took place at the violet end of the spectrum, where the heating power is least, or at the red where the heat is greatest. From the investigations and experiments thus suggested, it became evident that light was composed of three distinct properties, producing heating, chemical and luminous effects.

Strange it seems that light, so common and so universal, should have been for so long a period so imperfectly understood that even now it is only partially comprehended. "An agent influencing every form of animate and inanimate creation would necessarily excite the attention of the earliest races," but all that the untutored mind could recognise was something mysterious and divine, and that principle which renovated all things was to them the impersonation of a God; and light became the earliest object of idolatrous adoration. The ancient philosophers gave but little attention to natural science. The story of the heating mirrors of Archimedes would seem to imply that he had paid some regard to the properties of light, but what it was in its nature, and what it could effect by those properties, was still left in uncertainty. There was an old notion that certain objects possessed the property of emitting light in the darkness. Benvenuto Cellini says, that he has seen the carbuncle glowing like a coal with its own light. Alchemists, with their strange wild dreams of transmuting baser metals into pure virgin gold, began to direct their attention to the influence of the sun's rays. With them we have the first indication of anything like photographic experiment, and to them we owe many important observations and great discoveries.

The transmuting stone, which formed the foundation of our modern chemistry, succeeded in uniting silver with a marine salt, and produced a combination commonly called *lune*, or argent cornæ. The salt produced by the alchemist possesses the remarkable property of turning black, and the blackness was vivid just in proportion as the rays which occasioned it were powerful. They knew that if they covered a sheet of paper with a coating of argent cornæ, or, as it is now called, chloride of silver, and obtained by a lens the form of some object upon the coating, the parts

occupied by the figure would change to a dark color while the other portions continued white. But still, with all this, the minds of the alchemists were too abstract to reduce their discovery to any practical purpose.

About two centuries ago, Giovanni Battista Porta, a Neapolitan physician, discovered that if light were admitted through a small circular aperture into a closely-shut room all the objects without, from which reflected rays reached the hole, would be painted on the opposite wall in strength and size according to their distance, with their forms and relative situations as in an extended picture, with the most precise exactness. Here we have the origin of the camera-obscura.

In 1711, it was found that solutions of saltpetre and sal ammoniac crystalized more readily when exposed to the influence of light, than they did in the darkness. Charles William Scheele, of Stralsund, in Swedish Pomerania, discovered that the chloride of silver spread on paper, was speedily darkened in the blue rays, and that the red rays produced but little effect upon it.

Still later experiments made by Mr. Seebeck disclosed the fact, a colored impression of the solar spectrum was made upon paper spread with muriate of silver. Dr. Wollaston obtained the same results. M. Charles, a Frenchman, succeeded in obtaining black profiles by the action of light, but he never made known the nature of his process, and his secret died with him. The first authentic information respecting the new art was furnished by Mr. Wedgwood, the celebrated porcelain manufacturer, who, in June, 1802, published, in the Journals of the Royal Institution, "An account of a method of copying painting upon glass, and of making profiles by the agency of light, upon nitrate of silver; with observations by H. Davy."

The account of Mr. Wedgwood's investigation is remarkably interesting, especially as it is the first systematic effort to obtain photographic pictures. The following remarks occur in his memoir: "White paper or white leather, moistened with a solution of nitrate of silver, undergoes no change when kept in a dark place; but on being exposed to the daylight it speedily changes color, and after passing through different

shades of grey or brown, becomes at length nearly black. The alterations of color take place more speedily in proportion as the light is more intense. In the direct beams of the sun, two or three minutes are sufficient to produce the full effect; in the shade several hours are required, and light transmitted through different colored glasses acts upon it with different degrees of intensity. Thus it is found that red rays, or the common sun beams passed through red glass, have very little action upon it; yellow and green are more efficacious; but blue and violet light produces the most decided and powerful effects."

Again, "when the shadow of any figure is thrown upon the prepared surface, the part concealed by it remains white, and the other parts speedily become dark. For copying paintings on glass, the solution should be applied on leather, and in this case it is more readily acted on than when applied on paper. After the color has been once fixed on the leather or paper, it cannot be removed by the application of water, or water and soap, and it is in a high degree permanent. The copy of a painting or a profile, immediately after being taken, must be kept in an obscure place; it may indeed be examined in the shade, but in this case the exposure should be only for a few minutes; by the light of candles or lamps, as commonly employed, it is not sensibly affected. No attempts that have been made to prevent the uncolored parts of the copy or profile from being acted upon by light have as yet been successful. They have been covered with a thin coating of fine varnish, but this has not destroyed their susceptibility of being colored; and even after repeated washings, enough of the active part of the saline matter will still adhere to the white parts of the leather or paper to cause them to become dark when exposed to the rays of the sun. Besides the application of this method of copying that has just been mentioned, there are many others; and it will be useful for making delineations of all such objects as are possessed of a texture partly opaque and partly transparent. The woody fibres of leaves and the wings of insects may be pretty accurately represented by means of it, and in this case it is only necessary to cause the direct solar light to pass through them, and to receive the

shadows upon prepared leather. "The images," says Davy, "formed by means of a camera-obscura have been found too faint to produce in any moderate time an effect upon the nitrate of silver: To copy these images was the first object of Mr. Wedgewood in his researches on the subject, and for this purpose he first used the nitrate of silver, which was mentioned to him by a friend as a substance very sensible; but all his numerous experiments, as to their primary end, proved unsuccessful. In following these processes I have found that the images of small objects produced by means of the solar microscope may be copied without difficulty on prepared paper. This will probably be a useful application of the method; that it may be employed successfully, however, it is necessary that the paper be placed at but a small distance from the lens."

"In comparing the effects produced by light upon muriate of silver with those produced upon the nitrate, it seemed evident that the muriate was susceptible, and both were more readily acted upon when moist than when dry—a fact long ago known. Even in the twilight the color of moist muriate of silver, spread upon paper slowly changed from white to faint violet; though, under similar circumstances, no immediate alteration was produced upon the nitrate. . . . Nothing but a method of preventing the unshaded parts of the delineation from being colored by exposure to the day, is wanting to render this process as useful as it is elegant."

After these imperfect and comparatively insignificant results, nothing was attempted until the researches of MM. Niepce and Daguerre. M. Niepce was a retired man of business, residing in the neighborhood of Chalons sur Saône. He devoted much of his time to scientific inquiry, and especially to photographic experiments. His first connexion with M. Daguerre took place in the month of January, 1826. This latter gentleman had for a long time been engaged in similar experiments, and had already so far accomplished his object, as to have now only to fix the images of his design in the dark chamber to make his plan perfect.

When M. Niepce visited England in the following year, he presented a paper on the subject of photography to the Royal Soci-

ety of London, together with several pictures on metal plates. In 1829, he communicated with M. Daguerre, and they entered into an agreement to pursue for their mutual benefit the researches in which they were both so deeply interested. The registered deed of partnership is dated 14th of December, 1819.

The process of M. Niepce may be understood from the following extracts. Says he:—

"The discovery which I have made, and to which I give the name of heliography, consists in producing spontaneously by the action of light, with gradations of tints from black to white, the images received by the camera-obscure. Light in its state of composition and decomposition acts chemically upon the bodies. It is absorbed, it combines with them, and communicates to them new properties. Thus it augments the natural consistency of some of these bodies; it solidifies them even, and renders them more or less insoluble, according to the duration or intensity of its action. The substance which has succeeded best with me, and which concurs most immediately to produce the effect, is asphaltum of bitumen of Judea, prepared in the following manner:—I fill about half a wineglass with this pulverised bitumen. I pour upon it drop by drop the essential oil of lavender, till this bitumen can absorb no more. I afterwards add as much more of the essential oil as will cause the whole to stand about three lines above the mixture, which is then covered and submitted to a gentle heat, until the essential oil is fully impregnated with the coloring matter of the bitumen. If this varnish is not of the required consistency, it is to be allowed to evaporate slowly, without heat, in a shallow dish, care being taken to protect it from moisture, by which it is injured and at last decomposed. A tablet of plated silver is to be highly polished, on which a thin coating of varnish is to be applied cold with a light roll of very soft skin; this will impart to it a fine vermilion color, and cover it with a very thin and equal coating. The plate is then placed upon heated iron, which is wrapped round with several folds of paper, from which, by this method, all moisture has been previously expelled. When the varnish has ceased to simmer, the plate is withdrawn from the heat, and

left to cool and dry in a gentle temperature, and protected from a damp atmosphere. The plate thus prepared may be immediately submitted to the action of the luminous fluid in the focus of the camera. But even, after having been thus exposed a length of time sufficient for receiving impressions of external objects, nothing is apparent to show that these impressions exist. The forms of the future picture remain still invisible. The next operation, then, is to disengage the shrouded imagery, and this is accomplished by a solvent." Into this solvent, which it appears is formed of essential oil of lavender and oil of white petroleum, the silver tablet is plunged, and slowly the picture begins to appear. The plate is then lifted out and held in a vertical position, till as much as possible of the solvent has been allowed to drop away. The pictured tablet is now carefully washed by being placed upon an inclined plane, over which a stream of water is carefully poured.

Still later, we find M. Niepce complaining of the imperfection of his plan, but, stating that he now employed iodine in the preparation of his plates. Silvered plates prepared with iodine is the great secret of the photographic art.

In 1839, M. Daguerre made known the result of his experiments. He prepared the silvered plates, brightly polished, by placing them over a box, at the bottom of which there was a little iodine undergoing spontaneous evaporation. Thus prepared by receiving a thin film of the iodine, the plate was exposed to the focus of the camera; there it received the image presented to it: when removed, not a trace of the picture was to be seen, but one uniform dark shade without any mark. The plate was then exposed in a second box to an ascending mercurial vapor, heated from below by the action of a spirit-lamp. The effect produced was as curious as it was interesting. The small globules of mercury began immediately to settle upon those parts of the plates which have been effected by the action of the light. Gradually, the higher lights and the half-tints were developed. Like a delicate graver, the mercury settled on each part of the plate with the proportionate depth.

When the picture had been fully brought out, the plate was immersed in a solution

of hypo-sulphite of soda, and afterwards washed with hot distilled water. At that time no method had been discovered by which the photographic image could be "fixed," and the long period necessary for obtaining an impression upon the prepared plate when in the camera, rendered it useful only in taking views or copying engravings.

From that time to the present wonderful improvements have been made in the process. Formerly hours elapsed before an impression was obtained; now a few seconds suffices to secure an accurate and striking portrait. M. Daguerre made known his discovery to the scientific world of Paris. In July, the same year, (1839), a bill was passed securing to him a pension for life of 6,000 francs, and to M. Niepce of 4,000 francs. These things are very differently done in France and in England, and inventors and discoverers are not there altogether overlooked. France purchased the secret, and gave it to the whole world; but in spite of the declaration that the invention did not admit of being secured by patent, for as soon as published all might avail themselves of its advantages, royal letters patent were granted for the exclusive use of the same in the United Kingdom. It is unnecessary in this place to comment upon the fact, or detail the law proceedings consequent thereupon.

In the hands of M. Claudet, and other well-known photographers both in England and America, daguerreotype has vastly improved. A degree of sensibility has been given to the plate which it seems almost impossible to surpass. After a coating of iodine has been obtained upon the polished surface of the plate, it is exposed to the influence of chloride of bromine. Fizeau recommends the use of bromine water for the purpose of improving the sensitiveness of the iodized plates. This is prepared by shaking together in a bottle some bromine and water, care being taken that the bromine appears in excess. One part of this bromine liquor is united with thirty or forty parts of water, and being poured into a square shallow vessel covered with a glass, the iodized plate is exposed to its action for a few seconds, during which it passes from a yellow color into a rose hue, which is generally supposed to be the most sensitive coating.

After having been exposed in the camera, it is not necessary, when placed in the mercurial vapor box, to heat the mercury. Faraday proved that mercury was volatilized at common temperature; and Moser has pointed out that if the daguerreotype plate is placed over a vessel of cold mercury for some hours, the image will be brought out in the same manner as if the mercury had been warmed. Heating the mercury facilitates the process, but must be done with great care.

The chloride of gold has been recommended for the purpose of giving adhesion to the mercurial deposit. After the iodine has been removed from the plate, it is placed upon an iron frame, and a sufficient quantity of the solution of salt of gold poured carefully upon it, so as to entirely cover the surface. It is then heated by a spirit lamp, and the impression at once assumes greater depth and force of tone; the solution is then poured off, the plate well washed with distilled water and thoroughly dried. This process not only improves the general effect of the picture, but renders it also far less liable to injury.

It is not the brightest and clearest sunshine which is most favorable to photographic experiment. In England, the months of March, April, and May, are far more favorable to these operations than June, July, and August. In tropical climes, when a brilliant sun is giving the utmost degree of illumination to all surrounding objects, all photographic operations are acted upon more slowly than in the climate of England, where the light is less intense. As a remarkable instance of this fact, a circumstance may be mentioned which is curiously illustrative of this phenomenon:—A gentleman, well acquainted with the daguerreotype process, took with him to Mexico all the necessary apparatus and chemicals, expecting under the bright light and cloudless skies of that climate, to produce pictures of superior excellence. Failure upon failure was the result, and although every care was used, and every precaution adopted, it was not until the rainy season set in that he could secure a good daguerreotype of any of the buildings in that far-off land. A similar failure attended the experiments made by order of the French government in Egypt and central America.

The expense and inconvenience of me-

talic plates, particularly to travelers, renders it desirable that some other material should be employed instead. Attempts were made to obtain photographic effects upon paper, and the experiments were successful. In 1834, Mr. H. Fox Talbot began some researches with a view of rendering the images of the camera-obscure permanent. On the 31st of January, 1839, six months prior to the publication of Daguerre's process, a paper, giving an account of Talbot's labors was read before the Royal Society. In February, 1839, the method of preparing photogenic paper was made known.

The following is the method of obtaining pictures by the calotype or talbotype process. A hundred grains of crystalized nitrate of silver should be dissolved in six ounces of distilled water. The paper which is to be employed should be washed on one side with this solution. It must then be allowed to dry. Afterwards it must be dipped into a solution of iodide of potassium, containing five hundred grains of that salt dissolved in one pint of water, and be permitted to remain in this solution two or three minutes. It must then be dipped into a vessel of pure water, and lightly dabbed with blotting paper. This should be done by candle-light. This is called iodized paper. When required for use, a sheet of this iodized paper may be taken and washed with a liquid prepared in the following manner:—Dissolve one hundred grains of crystalized nitrate of silver in two ounces of distilled water; add to this one-sixth of acetic acid. Let this mixture be called A. Make a saturated solution of crystalized gallic acid in cold distilled water. The quantity dissolved is very small. Call this solution B. These two solutions are to be mixed together in equal quantities. After the paper has been washed with this liquid, which must not be done in the daylight, it should rest half a minute, and be then dipped into water. It must then be lightly dried with blotting paper. When dry the paper is fit for use. If used immediately, the last drying need not be attended to, the paper being placed damp in the camera.

When the paper is removed from the camera, very little or no trace of a picture is visible, until it has been subjected to the action of a solution of gallic acid and

aceto-nitrate of silver, which is applied to the surface of the paper on which the latent image has been formed, the development of the picture being accelerated by the cautious application of heat. It is then washed first in distilled water and afterwards in a solution of hyposulphite of soda, for the purpose of removing the nitrate and iodide of silver, and so fixing the picture that it may undergo no further change when exposed to the light. It is lastly dried between folds of blotting paper.

The picture thus obtained, is, however, a negative impression, that is, the positions

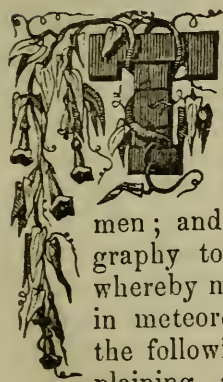
of the objects, together with the lights and shades, are totally reversed with respect to their real appearance. In order to obtain the positive or correct representation, the negative picture is laid perfectly flat and smooth on paper prepared with muriate of baryta and nitrate of silver, and then being placed in the reversing frame, or between two pieces of glass and exposed to the light, the correct impression is produced.

We shall revert to this subject on another occasion.

From the Illustrated Magazine of Art.

PHOTOGRAPHIC SELF-REGISTERING MAGNETIC AND METEOROLOGICAL APPARATUS.

INVENTED BY MR. BROOKE, OF KEPPEL-STREET, LONDON.



THE importance of instruments whereby the direction and intensity of the earth's magnetism may be readily ascertained, is acknowledged by all scientific men; and the application of photography to this purpose is a means whereby much labor has been saved in meteorological observations. In the following paper we purpose explaining, as briefly as we can, how these observations are made by self-registering apparatus.

Terrestrial magnetism is a *directive*, not an *attractive* force, exercised by the earth and its surrounding atmosphere upon a compass needle, or a freely suspended bar magnet. That it is not an attractive force, may be readily shown by floating a compass needle by means of a piece of cork on a vessel of water: the needle will be found to take its position in the direction of the magnetic meridian; but it exhibits not the least tendency to float towards the north, although perfectly free to do so if any attractive force were exerted upon it in that direction.

The *magnetic* does not coincide with

the *astronomical* meridian, but is variously inclined to it at different points of the earth's surface. The angle at which these two meridians are inclined to each other is the *magnetic declination*. The value of this angle is at the present time about $22\frac{1}{2}^{\circ}$ in the vicinity of London, and its direction towards the west.

A compass needle is ordinarily supported in such a manner as to rest horizontally in the magnetic meridian; but if it be so sustained as to be capable of moving freely in a vertical plane, the marked end of the needle will point or dip downwards, and the angle which the needle when in its position of rest makes with the horizontal plane is called the dip. The present value of this angle, in the same locality, is about $68\frac{3}{4}^{\circ}$.

The force by which the marked end of the needle is thus directed obliquely downwards, may be conceived to be compounded of two forces, one acting horizontally and the other vertically; by the former of which, acting alone, the needle would assume a horizontal, and by the latter a vertical position. In the present instance, the proportion of the vertical to the horizontal force is nearly as 2 to 1.

These three elements of terrestrial mag-

netic force, namely, the declination or direction of the vertical plane in which it is exerted, and the amount of its horizontal and vertical components, are found to be continually in a state of change: some of the variations being of a periodical character, while others, far more irregular and extensive in amount, are of less frequent occurrence, and arise from causes that are at present very imperfectly understood.

The general object of magnetic observations is to obtain a complete knowledge of the physical causes on which the existence of terrestrial magnetism, and its various changes, depend. This knowledge is to be sought by a comparison of the observed changes in the three elements of magnetic force with the occurrence of other natural phenomena. The instruments by which the changes of the magnetic elements are observed are the declinometer, the bifilar or horizontal force magnetometer, and the balanced or vertical force magnetometer. The declinometer consists of a bar magnet freely suspended by a bundle of untwisted silk fibres; the variations of the position of this magnet correspond with those of the vertical plane in which the earth's force is exerted. The bifilar is a similar bar magnet, suspended by two nearly parallel bundles of fibres, separated by a small interval. The double point of suspension is twisted round until the bar assumes a position exactly perpendicular to the magnetic meridian, in which it will then be retained by the opposition of two equal forces—the gravity of the bar and its appendages tending to untwist the suspensive skeins, while the horizontal component of the earth's force tends equally to turn the bar in the opposite direction. As the former of these forces remains constant, it is clear that any variations of the latter will produce corresponding changes in the position of the magnet; and it is by observation of these changes of position that the variations of horizontal magnetic force are determined.

The balanced magnetometer is a bar magnet, very delicately poised on knife edges, so as to move in a vertical plane like the beam of a balance. The instrument is placed at right angles to the magnetic meridian, and is maintained in a horizontal position by a weight, which counteracts the tendency of the earth's vertical

force to place the magnet in a vertical position. As the counterpoise remains constant, it follows that any changes in the amount of vertical force will be indicated by corresponding changes in the position of the magnet; which latter have been made a subject of observation.

The method hitherto adopted for observing the indication of these instruments, has been that of viewing, through a fixed telescope, the division of a fixed scale reflected by a plane mirror attached to each magnet. But by this system of observation a very imperfect knowledge of the nature of magnetic changes has been obtained; and as it has been deemed necessary, in magnetic observatories, that the observations of the various instruments should be made at intervals of at furthest two hours, by night as well as by day, this laborious duty has devolved upon the assistants; hence some means of enabling these instruments to record their own changes has long been an acknowledged desideratum in physical science. With the aid of photography this desired object has been attained by the instruments that form the subject of this notice, the merit of which has been acknowledged by the award of a council medal by the jurors of the Great Exhibition of 1851.

By these instruments an uninterrupted and unerring record of all magnetic changes is now maintained at the Royal Observatory, Greenwich. These results could not have been obtained by personal observation; for even if every telescope were constantly watched by the eye of an assistant (which would require a very numerous staff), the results would still be liable to errors of observation; and occasionally the magnetic variations are too rapid and transient to be continuously recorded by an observer. We may further remark, that since the employment of this apparatus at Greenwich, the number of assistants in the magnetic department has been reduced, and the fatigue of night duty has been dispensed with entirely.

Magnetic registration is undoubtedly the most useful application hitherto made of the beautiful art of photography. The method suitably applied to each of the magnetic instruments may be thus described:—A concave metallic mirror, three inches in diameter, is attached to each magnet by a frame possessing all requisite

adjustments; the rays of light from a lamp or gas-burner, placed at a distance of about two feet from the mirror, pass through a small aperture in a metallic plate, and fall on the mirror, when they are reflected to a focus at a distance of about nine feet. The source of light being fixed, it is clear that the movements of the focal point of light will correspond with those of the magnet. A cylinder covered with photographic paper is so placed that the point of light may fall on it. The cylinder is carried round on its axis by clock-work, and by the combined movements of the point of light and of the cylinder, the magnetic curve is self-traced upon the sensitive paper. The photographic process has also been applied to the barometer, and to the wet and dry bulb thermometers; but the mode of application is different from the preceding, the light not being reflected from a mirror. The description of the figures will render further explanation unnecessary.

As the preparation of the sensitive paper used in these instruments differs somewhat from the ordinary photographic processes, it may not be inappropriate to describe it:—The paper is first washed with a solution of four grains of isinglass and of iodide, and twelve of bromide of potassium, in one fluid ounce of distilled water, and dried quickly by the fire; a considerable quantity of paper may be thus prepared at once. Previously to being placed on the cylinder, the paper is washed over with a solution of fifty grains of nitrate of silver to one ounce of water, which communicates to it the requisite degree of sensibility. After having been in action for twenty-four hours, the paper is removed from the cylinder, and the impression developed with a warm solution of twenty grains of gallic acid to one ounce of water, with a small addition of the ordinary commercial strong acetic acid. We may now proceed to explain the working of these very ingenious instruments.

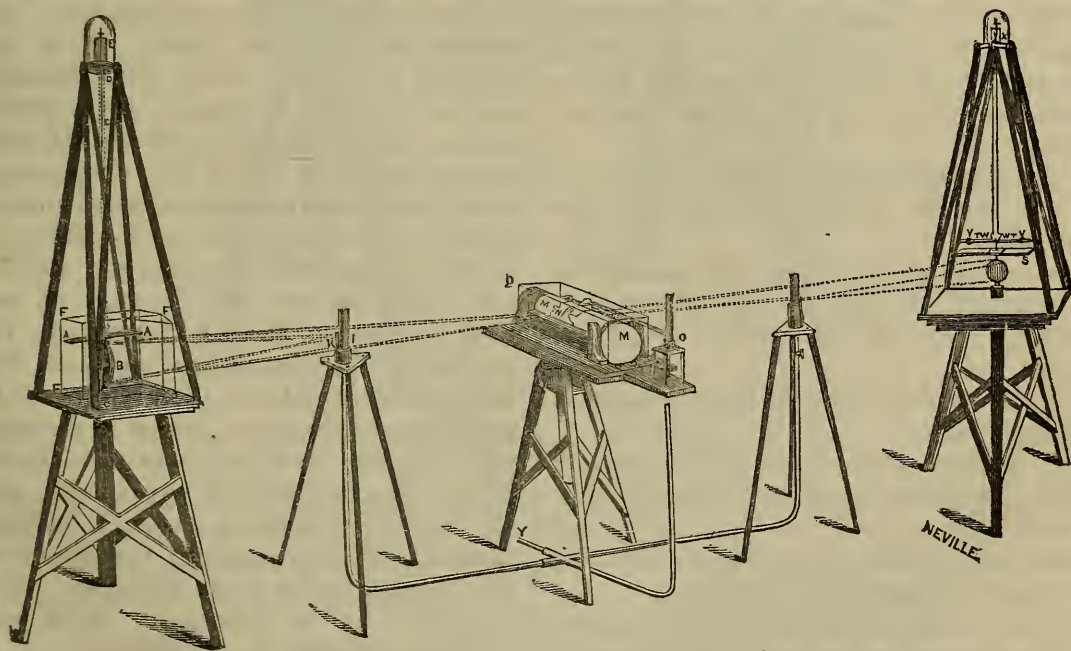


FIG. 1.—BROOKE'S SELF-REGISTERING DECLINOMETER, AND BIFILA MAGNETOMETER.

Fig. 1 represents the principal self-registering apparatus invented by Mr Brooke. The apparatus is supported by a framework of tubes springing from the four corners of a black marble slab (which when in actual operation, would be cemented on the top of a stone pillar firmly fixed in the ground, and insulated from the floor of the observatory): these tubes, about four feet

long, converge alternately to four points of the torsion plate; they thus compose a framework possessing great stiffness. To the suspension frame of each magnet, a plane glass mirror and a concave metallic speculum are attached. The plane mirror is for the purpose of making eye-observations with a telescope in the usual manner. A gas-light or lamp is so placed, at a dis-

tance of about two feet in front of each speculum, that an image of a small slit in the copper chimney surrounding the burner may fall on the sensitive paper attached to the registering apparatus. This consists of a stand supporting horizontally on friction rollers two concentric glass cylinders, round the inner of which is wrapped a sheet of prepared photographic paper: the outer or covering cylinder keeps the paper moist during the twenty-four hours it remains in action. A bent arm, attached to the axis of these cylinders, is carried round by a fork at the end of the hour-hand of a time-piece specially constructed for the purpose. The horizontal motion of the tracing point of light combined with the vertical motion of the paper, traces out the magnetic curve. A third light is attached to the registering apparatus, for the purpose of drawing a standard or base line on the paper; by the varying distance of any point of the magnetic curve from this line, the magnetic variation is determined. At the distance at which these instruments are placed, an angle of 1° is represented by two inches on the paper; but the scale value may be enlarged at pleasure, by placing them further apart.

A A, the declination magnet.

B, a concave speculum attached to the magnet.

C, a plane glass mirror also attached to the magnet, for making observations by a telescope, on the old method when required.

D, the torsion plate, reading to minutes by two verniers.

E, a frame standing upon the torsion plate. A hook, capable of being raised or lowered by a screw, is attached to this frame, from which the magnet is suspended by a skein of untwisted silk fibres.

FFF, a glass box, in which the magnet and its appendages are enclosed, to protect them from the air; for the same purpose, the suspension skein is enclosed in a glass tube G, which passes through a stuffing box H, in the lid of the box.

I, a gas-burner enclosed in a brass chimney, from which the light can escape, except a small pencil which passes through a narrow slit H, capable of being adjusted by a screw; on the breadth of this slit, the breadth of the register line depends.

L L, a combination of two plano-convex

cylindrical lenses. The pencil of light passing through K, falls on the mirror B, and is reflected to the cylindrical lenses; by these, the image of the slit is condensed to a point of light on the surface of

M M, the registering apparatus, consisting of two concentric cylinders, between which the photographic paper is placed.

N, the magnetic curve traced by the point of light.

O, a gas-burner, fixed to the stand on which the cylinders rest.

P, a plano-convex prismatic lens, attached to the top of

Q Q, an opaque box, which protects the photographic paper from extraneous light. A pencil of light from O passes through P, and is brought to a focus on the surface of the paper.

R, the base line, described by the point of light.

S S, the bifilar, or horizontal force magnetometer.

T T, the apparatus for producing an automatic temperature compensation; this consists of two zinc tubes, which are clamped to a glass rod by two adjustable clamps V V, the suspension skein passes over a pulley X, and the ends are attached to two hooks, W W; as the temperature rises, these hooks are approximated to each other by a quantity equal to the difference of the expansion of the glass rod and the zinc tubes, between the clamps V V; and thus the torsion force is diminished; the position of the clamps is so adjusted, that the diminution of the torsion force shall be equivalent to the loss of power in the magnet: and *vice versa*, when the temperature falls. The magnet, its appendages, and the suspension skein are enclosed similarly to the declination magnet; the glass box, &c., is omitted to avoid confusion. The registration of its movements is likewise similarly effected on the opposite side of the cylinders.

A blackened zinc case is placed over the cylinders, when in actual operation, to prevent any light from falling on the paper, except the two pencils which describe the magnetic curves, and another which passes through a prism on the top of the case, and draws the base line. In order to avoid confusion this is omitted in the drawing, as well as another case of the same material, which covers the whole of the apparatus,

to protect the sensitive paper from any stray light, as well as to defend the whole from dust, &c.

Fig. 2 represents the Balanced Magnetometer, the Barometer, and the apparatus

on which the indications of both these instruments are registered.

A A, a self-registering barometer, enclosed in a case, resting on a stand.

B B, the upper and lower ends of a sy-

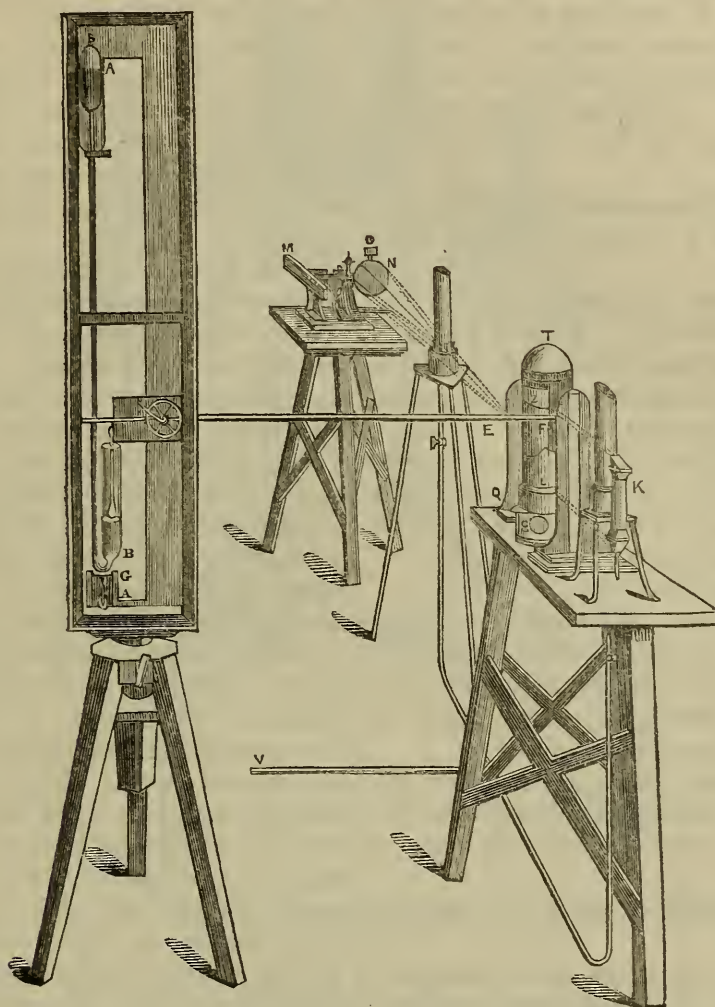


FIG. 2.—BROOKE'S SELF-REGISTERING BALANCED MAGNETOMETER, AND BAROMETER.

phon barometer tube, which are of the same diameter, and of large size.

C, a float resting on the surface of the mercury, which hangs in a notch on the short arm of a lever.

D, the pivot on which the lever turns.

E, the long arm of the lever, which carries at its extremity an opaque screen F, with a small aperture, through which a small pencil of light passes.

G, a plate on which the tube rests, which is raised or lowered by a screw.

H, a stand supporting a gas-burner.

I, the register line, described by the pencil of light transmitted by the screen F, which will evidently rise and fall with the column of mercury; the indications will be

amplified in proportion to the length of leverage.

K, a tube with a plano-convex prismatic lens at each end of it, placed at the back of the burner; through this, a pencil of light is conducted in the direction indicated by the dotted line, and describes the base line L. By this arrangement, two pencils are derived from the same source of light, which fall perpendicularly on two remote points of the paper.

M, the Balanced Magnetometer, is supported by a brass framework surmounted by agate planes, and firmly attached to a slab of black marble, which, like the preceding instruments, would be cemented on the top of an insulated stone pillar, when

in actual operation ; it would also be enclosed in an air-tight case (omitted in the drawing), having a plate-glass window in front of

N, a concave speculum, connected with the magnet by a brass bar in which two agate knife edges are imbedded ; these rest on the agate planes attached to the supporting frame. The knife edges may be raised out of gear on four *r*'s by means of an eccentric.

o, is a small plane mirror for making observations with a telescope in the usual manner.

P, a gas-burner, similar to those of the preceding instruments. A small pencil of light proceeding from this is reflected from the speculum N towards the photographic apparatus, and passing through

Q, a combination of two plane convex cylindrical lenses in a frame of wood, falls upon a vertical revolving cylinder covered with photographic paper, and describes

R, the register line.

S, is a brass frame which supports a turn-table on three vertical and three horizontal rollers. A pin projects vertically from the centre of the turn-table, which enters a hole in the centre of the cap of

T, the cylinder, resting on the turn-table ; by these means the axis of the cylinder always coincides with the axis of revolution.

V is the gas-pipe by which the burners are supplied.

The balanced magnetometer is, like the bifilar, furnished with an automatic temperature compensation, not visible in the drawing. This consists of a small thermometer tube, clamped to the magnet, so that the axis of the tube may be in the same horizontal plane with the centre of gravity of the magnet and its appendages, and the centre of motion between the bulb and the end of the thread of mercury in the bore. The length of the stem, and the capacity of the bulb and bore, are so adjusted that the weight of the small quantity of mercury driven out of the bulb by expansion, may exactly counter-balance the loss of power in the bar occasioned by the same elevation of temperature.

The necessity of this and the previously described temperature compensation, will be better understood by stating that in both the force magnetometers, the position

of equilibrium of the instrument depends on the natural action of the earth's magnetism and the free magnetism of the bar, and that a variation of either of these elements will induce a corresponding change of position of the magnet. In order, therefore, that the magnetic curve may truly represent the changes in the earth's force, it is necessary that the variations of force in the bar itself should be mechanically counteracted by the same agency that produces them, namely, change of temperature.

Fig. 3, is a representation of the self-registering thermometer and psychrometer. This is essentially a wet and dry bulb self-registering thermometer. The bulbs of the thermometers are placed underneath the table, through which the stems pass vertically, and are placed between the opposite sides of the cylinders and two lights. A narrow vertical line of light, brought to a focus by a cylindrical lens, falls on the stem of the thermometer, and passing through the empty portion of the bore, affects the prepared paper. The boundary between the dark and undarkened portions indicates the position of the mercury in the stem of the thermometer. Fine wires are placed across the slit in the frame through which the light falls on the stem ; and coarser wires at every 10th degree as well as at certain other fixed points of the scale, namely, 32°, 54°, 76°, and 98°. The shadows of these wires protect the portions of the photographic paper on which they fall from the action of light, and the darkened surface of the paper is consequently traversed by a series of parallel pale lines ; and the relative position of the broad and narrow lines readily explain the temperature indicated by the register. In this illustration figures are used instead of letters :—1, 2, are camphine lamps,—now superseded by gas, whereby the time and labor of trimming, and a greater uniformity of light has been obtained ;—3, 4, are cylindrical lenses, by which a bright focal hue of light has been obtained ; 5, the psychrometer or wet bulb thermometer ; 6, the dry bulb thermometer ; 7, two concentric cylinders, between which the photographic paper is placed ; 8, the register, as it appears after the impression is developed ; 9, one of the rollers of a turn-table, on which the cylinders rest ; 10, the

frame which contains the timepiece; 11, a bent pin, or carrier, attached to the axis of the cylinder, this is carried round by a

fork at the end of the hour-hand of the timepiece.

As this apparatus is necessarily placed

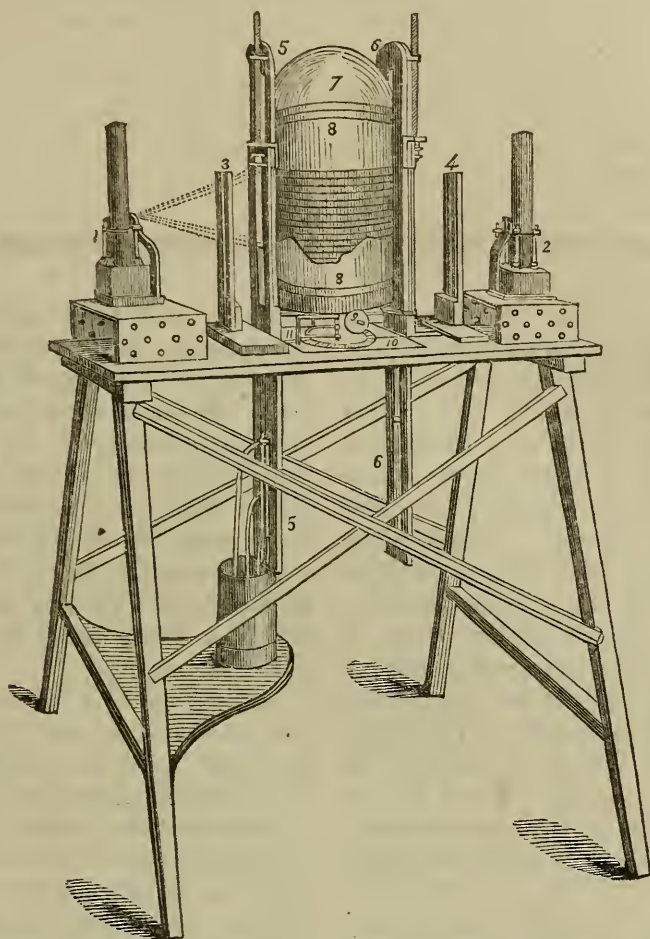


FIG. 3.—BROOKE'S SELF-REGISTERING THERMOMETER AND PSYCHROMETER.

in the open air, when in actual operation, it is provided with an inner cylindrical zinc case, with sliding doors, to protect the sensitive paper from light, when the cylinder is removed from, and brought back to, the photographic room; and an outer wind and water-tight zinc case, with water-tight doors, for removing and replacing the cylinders, and for trimming the lamps, if lamps are used.

As the time pieces employed in notating the photographic cylinders exhibit several peculiarities of construction, our account of the apparatus would be incomplete without some mention of them. In order to avoid the unsteadiness of the hour-hand, which in ordinary movements results from the play of the motion-wheels under the dial, the central axis which carries the minute-hand is placed out of the centre. As the forked or carrying arm is firmly at-

tached to the axis, another moveable hand or pointer is added, which travels with the former, and points to the hour. The compensating-bars of the balance of this piece are composed of brass and palladium, to prevent the rate being influenced by proximity to the magnets. The number of the leaves in the pinions are all prime to the numbers of the teeth in the wheels with which they are in gear, to diminish the chance of irregular motion from wear, as the face of the piece must necessarily be exposed.

A lithographic fac-simile of one day's work of all the photographic self-registering instruments employed at the Royal Observatory, Greenwich, will be found in the introduction to the volume of "Greenwich Magnetical and Meteorological Observations for 1847," to which the reader is referred for further information respect-

ing the practical application of the apparatus, as well as for a more detailed description of it. The reader is also referred

to a series of papers by the inventor, published in the "Philosophical Transactions."

ON FIXING THE PHOTOGRAPHIC PICTURES.



THE power of destroying the susceptibility of a photographic agent to the further action of light, when the picture is completed by its influence, is absolutely necessary for the perfection of the art. Various plans have been suggested for accomplishing this, which have been attended with very different results; few, if any, of the materials used producing the required effect, and, at the same time, leaving the picture unimpaired. The hyposulphite of soda is decidedly superior to every other fixing material; but it will be interesting to name a few other preparations, which may be used with advantage in some instances.

The pictures formed on papers prepared with the nitrate of silver only, may be rendered permanent by washing them in very pure water. The water must be quite free from any muriates, as these salts attack the picture with considerable energy, soon destroy it, by converting the darkened silver into a chloride, which changes upon exposure.

The great point to be aimed at in fixing any of the sun-pictures is the removal of all that portion of the preparation, whatever it may be, which has not undergone change, without disturbing those parts which have been altered in the slightest degree by the chemical radiations. When a picture has been obtained paper prepared with the nitrate of silver, or the ammonio-nitrate of silver, the best mode of proceeding is to wash it first with warm rain water, and then with a diluted solution of ammonia: if the ammonia is too strong, it dissolves the oxide of silver, which in these processes is formed in the fainter parts of the

picture, and thus obliterates the more delicate portions. Herschel remarks—"If the paper be prepared with the simple nitrate, the water must be distilled, since the smallest quantity of any muriatic salt present attacks the picture impressed on such paper with singular energy, and speedily obliterates it, unless very dark. A solution containing only a thousandth part of its weight of common salt suffices to effect this in a few minutes in a picture of considerable strength."

Photographs on the muriated papers are not, however, so easily fixed. Well soaking these in water dissolves out the excess of nitrate of silver, and thus the sensibility is somewhat diminished; indeed, they may be considered as half fixed, and may in this state be kept for any convenient opportunity of completing the operation.

Muriate of soda (common salt) was recommended by Mr. Talbot as a fixing material, but it seldom is perfectly successful: as a cheap and easy method, it may be occasionally adopted, when the picture to be preserved is not of any particular consequence.

It may appear strange to many that the same material which is used to give sensitiveness to the paper should be applied to destroy it. This may be easily explained: In the first instance, it assists in the formation of the chloride of silver; in the other, it dissolves out a large portion of that salt from the paper, the chloride being soluble in a strong solution of muriate of soda. When common salt is used, the solution of it should be tolerably strong. The picture being first washed in water, is to be placed in the brine, and allowed to remain in it for some little time; then, being taken out, is to be well washed in water, and slowly dried. If the brine is used in a saturated

state, the white parts of the photograph are changed to a pale blue—a tint which is not, in some cases, at all unpleasant.

I have in my possession some pictures which have been prepared more than eight years, which were then fixed with a strong brine, and subsequently washed with warm water. They have become slightly blue in the white portions, but otherwise they are very permanent; and they have lost but little of their original character.

The chloride of silver being soluble in solution of ammonia and some of its salts, they have been recommended for fixing photographs. The ammonia, however, attacks the oxide, which forms the darkened parts in some preparations, so rapidly, that there is great risk of its destroying the picture, or, at least, of impairing it considerably. It matters not whether the liquid ammonia or its carbonate be used, but it must be a very diluted solution. The only photographs on which I have used it with any success are those prepared with the phosphate of silver; and to these it imparts a red tinge, which is fatal to their use for transfers.

The ferrocyanate of potash, or, as it is more commonly called, the prussiate of potash, converts the chloride into a cyanide of silver, which is not susceptible of change by light; consequently this cheap salt has been employed as a fixing agent, but most unfortunately, photographs which have been subjected to this preparation are slowly, but surely, obliterated in the dark.

The iodide of silver, which is readily formed by washing the photograph with a solution of the iodide of potassium, is scarcely sensitive to light; and this salt, used in the proportions of five or six grains to four or five ounces of water, answers tolerably well where transfers are not required. It tinges the white lights of the picture of a pale yellow,—a color which is extremely active in absorbing the chemical rays of light, and is therefore quite inapplicable where any copies of the original photograph are required; and, in describing the hydriodated photographs, other objections will be noticed.

Of all the fixing agents, the hyposulphite of soda is decidedly the best. This was first pointed out by Sir John Herschel, who also recommended that it should be used warm in some cases, which was the

plan adopted by Mr. Fox Talbot in the improvements of his calotype process.

To use the hyposulphite of soda with effect, there are several precautions necessary. In the first place, all the free nitrate of silver must be dissolved out of the paper by well washing; the photograph being spread on a plane surface, is to be washed by allowing a small stream of water to flow over it, at the same time dabbing it with a piece of soft sponge, until the water passes off perfectly tasteless. This operation should be repeated twice, or, in particular cases, even three times. The hyposulphite of soda has the property of dissolving a large quantity of several of the salts of silver, but particularly of the chloride, with which it combines, forming a triple salt of an exceedingly sweet taste. This salt is liable to spontaneous decomposition, accompanied with separation of silver in the state of sulphuret: hence the necessity of freeing the paper, by washing, of every trace of it, the sulphuret of silver being of a dirty brown. It might appear that the use of warm water would more effectually cleanse the paper; so far from it, it occasions the immediate formation of the sulphuret of silver.

Some operators prefer leaving the picture in a bath of the hyposulphite of soda for some time, and then removing the salt by simple immersion in water, frequently changing it. The advantages of this appear to be, that the surface of the paper is not disturbed by any rubbing action or by the mechanical action of water flowing over the surface. For fixing the calotype pictures, Mr. Cundell, to whom we are much indebted for improvements in this particular process, recommends the following mode of manipulation:—

The picture, or as many of them as there may be, is to be soaked in warm water, but not warmer than may be borne by the finger; this water is to be changed once or twice, and the pictures are then to be well drained, and either dried altogether, or pressed in clean and dry blotting-paper, to prepare them to imbibe a solution of the hyposulphite of soda, which may be made by dissolving an ounce of that salt in a quart of water. Having poured a little of the solution into a flat dish, the pictures are to be introduced one by one; daylight will not now injure them:

let them soak for two or three minutes, or even longer, if strongly printed, turning and moving them occasionally. The remaining unreduced salts of silver are thus thoroughly removed by soaking in water and pressing in clean blotting paper alternately; but if the time can be allowed, soaking in water alone will have the effect in twelve or twenty-four hours, according to the thickness of the paper. It is essential to the success of the fixing process, that the paper be in the first place thoroughly penetrated by the hyposulphite, and the sensitive matter dissolved; and next, that the hyposulphite compounds be effectually removed. Unless these salts are completely washed out, they induce a destructive change upon the picture; they become opaque in the tissue of the paper, and unfit it for the operation of being copied.

Being desirous, not merely of describing all those processes which have passed into common use, but those even which have been suggested merely upon the strength of a few experiments, where these appear likely to lead to any improved practice, under any circumstances, in the art, the following process of Reuben Phillips is introduced.

Mr. Phillips found that the solvent power of any menstrum was increased by voltaic action. He therefore employed electrodes the size of the photographic picture to be fixed, and placing upon the under one a flannel wetted with the solvent—either common salt, ammonia, or hyposulphite of soda—he placed the impressed paper, wetted with the same solution, on it, and laid another wetted flannel upon it, covering the whole with the other electrode. Connection being made with a tolerably active battery, the metallic salt is rapidly removed to one pole, and thus the fixing process rendered comparatively short and easy, where a voltaic battery is at command.

The hyposulphite of soda has been used for almost every photographic process, from the facility it affords for removing the silver salts. The following is the process of Gustave le Gray, of Paris, which is valuable as being the directions of one who has produced most beautiful pictures: but it does not differ in any important particulars from the process already given:—

“Make in a bottle the following solution:—Filtered water, about a pint and a half; hyposulphite of soda, about three ounces; cover the bottom of a dish with this, and plunge in your negative proof, taking care to avoid air-bubbles: this dissolves the bromo-chloro-iodide of silver, but does not attack the gallo-nitrate of silver, which forms the blacks.

“Never put more than one proof at a time in the bath; but you may use it for several proofs one after the other.

“If you examine the proof as a transparency after it has remained some time in the bath, you may be tempted to think it is lost, as in some places spots will appear from the iodide of silver not being completely taken away; but if you wait until it is removed, which you will know by the disappearance of the yellow tint, you will be astonished at the whiteness and transparency of the paper, as well as at the beauty of the blacks in the image.

“It will require for this, to remain in the bath from half an hour to three quarters; you will then wash it in several waters, and leave it in a basin of clear water for three quarters of an hour; then let it dry spontaneously by hanging it up; the proof is then quite unalterable by light, as there remains nothing more in the paper than the gallo-nitrate of silver, which is black.

“Fixing by means of the bromide of potassium is not so durable, because it does not remove any of the materials used in preparing the paper. It may, nevertheless, be of great use in traveling, and when it is required to make several proofs one after the other; because then you avoid touching the hyposulphite in preparing the negative paper, which spots at the least contact with it.

“You may thus place the whole of your negative proofs together in this bath.

“Water, a pint and three quarters; bromide potassium, 360 grains.

“In taking the proof out of the bath, you must wash it in several waters and dry it; it should be kept in the bath at least three quarters of an hour, but, if you leave it in two or three hours, it will not injure it.”

Such is M. le Gray's statement, and so it is rendered by his English translator, Mr. Cousins; but I believe the quantity

of the bromide of potassium to be by far too large, and that the pictures would sustain less injury by using a solution of one half the strength indicated. His process for fixing the positive pictures contains some important hints.

“Dissolve in a bottle hyposulphite of soda, 1500 grains;

“Filtered water, nearly a quart.

In another bottle dissolve 75 grains of nitrate of silver in a wine-glass or two of water; when well dissolved, you add to it a saturated solution of chloride of sodium, until the white precipitate ceases to fall; allow it to repose a short time, and then decant the clear liquor, and gather the precipitate of chloride of silver, which you dissolve in the other bottle of hyposulphite of soda; by means of this solution you obtain directly black tints upon the picture. The older the hyposulphite of soda is, the better: when it gets thick, you must add a fresh solution of hyposulphite alone, without the chloride of silver, the old containing an excess, which it has taken from the proofs already immersed in it. You must not filter it to take away the deposit, but only let it repose in a large bottle, and decant the clear liquid for use, leaving the sediment to be redissolved by fresh solution.

“By leaving the proofs a longer or shorter period in the bath, you can obtain all the tints from the red to the black, and clear yellow; with a little practice, you will be sure to get the tint you desire. You must not leave a proof less than an

hour in the bath for it to be sufficiently fixed, and it can remain three or four days to obtain the sepia and yellow. By heating the hyposulphite of soda I accelerate the operation; but we must not then leave the proof for an instant to itself, as the rapidity of action is great, that the picture might be completely effaced.

“By adding to the preceding solution about one fluid ounce of liquid ammonia, I obtain pretty bistre tints, and very pure whites. The English paper is exceedingly good for these tints.

“I obtain also fine velvet-like tints by putting the photograph (when taken out of the hyposulphite of soda) upon a bath of a salt of gold, using 15 grains of the chlorine of gold to one pint and a half of distilled water.

“Fine yellow tints are obtained by placing the proof (if too vigorous) first in a bath of hyposulphite, and then in a bath composed of one pint and a half of water, and one fluid ounce and a half of hydrochloric acid; washing it perfectly in water. Liquid ammonia, employed in the same quantity as last mentioned, gives remarkably fine tints.

“When the proof is the color you desire, wash it in several waters, and leave it two or three hours in a basin of water, until, touching it with the tongue, you perceive no sweet taste which indicates the presence of hyposulphite of silver; then dry it by hanging it up, and it is finished. The bath may contain as many proofs as can be conveniently placed in it.”—R. HUNT.

In choosing a lens, select one that gives the image clear to the edges of the ground glass, and do not attach too much importance to its rapidity of action; the image is better when it presents a clear aspect

generally, than when it is very clear in the centre, and becomes gradually indistinct towards the edges. It is also necessary to be well assured that the chemical focus coincides with the visible focus.

COMMUNICATIONS.

For the Phot. Art-Jour.

London, May 22d, 1853.

THE PRESENT STATE OF PHOTOGRAPHY IN ENGLAND.



It seems now to be generally admitted that the process of Photography upon silver plates, invented by M. Daguerre, has attained its utmost perfection. Certainly nothing can exceed the delicacy and beauty of the portraits that proceed from the ateliers of Claudet, or Kilburn, or Mayall, or Beard. Nor can any one desire anything more marvelously beautiful than the daguerreotypes of still-life, taken for the Stereoscope, with which Mr. Williams astonished the admirers of that philosophic and interesting toy.

We cannot, however, say thus much with regard to the twin-invention of Mr. Talbot. Crippled and constrained as this branch of photography was by patent-laws in England, it nevertheless found numerous admirers, especially among the wealthier classes; and from time to time, successful amateurs produced Calotype pictures which won the admiration and almost the envy of every assembly of artists. In France, meantime, various modifications of Mr. Talbot's original process were introduced. M. Niepce and M. Le Gray lent their valuable aid, and the pictures produced by these gentlemen, together with those by M. M. Martens, Ferrier, Bayard, Le Secq, Constant, Flacheron and Bresolin found their way into the portfolios of the artists and amateurs of London, and provoked a comparison by no means favorable to English photographers.

The labors of Mr. Archer, at length brought to light the marvellous celerity and the brilliant effects produced by the use of Iodised Collodion in the stead of paper. It was asserted that this discovery was equal to a new process superceding Mr. Talbot's patent right, and long letters and much discussion ensued thereupon.

In the autumn of last year, however, (as

all the world knows), Mr. Talbot was induced to present this invention, with one restriction only, to the Nation, and from that day, may be dated the second birth of photography in Great Britain. Since then our opticians have found no rest for mind or body—our camera makers have been inundated with orders—and Photographic Chemists have sprung up one after another, and continued to increase, till the unconscious public wonder and are amazed. The newspapers also are bitten with the mania. The "Illustrated London News" gives learned criticisms as incomprehensible as they are long, and advice which every tyro who has carried a camera laughs at till he weeps. "Notes and Queries" devotes columns upon columns to sapient inquiries, and often equally sapient answers, (though let us add, it is through this paper that Sir Wm. Newton and Dr. Diamond have given the world their valuable formulæ). The "Athenæum" professes itself a warm admirer of the art, and the "Art Journal" and the "Literary Gazette" constantly enlighten us with their suggestions. December last, a fresh impulse was given to photography by the wise and energetic measures of the Council of the Society of Arts. At the suggestion of a few of their members, they invited all photographers to send their works for exhibition. Upwards of a hundred lovers of the art responded to the appeal, and more than twelve hundred Calotype pictures were for the first time assembled and exhibited to public criticism. The success of the exhibition was immediate, and though there were many faults to be found—(an almost certain result in a first exhibition,) yet the public were delighted, and expressed their satisfaction in many ways.

A month afterwards, and the Photographic Society, which had long been in process of formation, held their first meeting in the gallery of the Society of Arts, surrounded by the first public collection of their works. Between three and four hundred members were immediately enrolled, and every week since has added to the list.*

* What a comment upon a like movement in

A monthly Journal of the transactions of the Society has regularly appeared, and there is no doubt but that the Society will contribute in a very great degree to the development of the Photographic Art. Indeed, while such men as Sir John Herschel, Sir David Brewster, Sir William Newton, Dr. Percy, Professor Shaw and Robert Hunt assist with their scientific researches, the Society must claim and take rank as the government of the Photographic world. Sir Charles Eastlake, the chairman, must be held to be the President, and the learned men who aid him will be his Ministers.

Other important movements have been made within this last month. The proprietors of the "Polytechnic Institute" have just added to their building a large glass room in which Mr. Malone and Mr. Pepper expatiate on the mysteries of chemical rays, &c. At the "Panopticon" the new building in Leicester Square, still larger accommodation has been accorded to Mr. Hennemen and his coadjutors—and in New Bond street, a "Photographic Institution" has been opened under the auspices of Mr. Phillip Delamotte, and a gallery has been filled with the choicest specimens that have yet been produced of the Photographic Art—a Review of these pictures in detail must be the work of a future communication. J. C.

FOR THE PHOTOGRAPHIC ART JOURNAL.

MR EDITOR: DEAR SIR—Some months have elapsed since my last attempt to be heard through your valuable journal, and now only, because you request it, for my own judgment tells me, that others could better occupy the space. Perhaps a general description of my mode of operating may interest some few of your readers, not because it is better than all others; but as good as any used, perhaps more expeditious. The preparation of my plates is wholly accomplished by machinery, clipping the corners, bending the edges, scouring or cleaning and buffing is all done by machinery, and in one-eight the time usually required by hand, one machine (the American Photographer,) four feet long,

this country. After ten years labor, but one Photographic Society is in existence, and that does not number more than twenty members. For shame America.—Ed. P. A. G.

four feet high, and two feet deep performs all the various processes through which the plate passes from clipping the corners until it is buffed, ready for the galvanic battery, each process with the machine, except clipping the corners and bending the edges, is so still that it can scarcely be heard in an adjoining room, and the whole is moved by one treadle which moves with such ease, that a boy twelve years old, can move it for hours in succession. There are two buffs connected with the main-shaft, the lower one a cone, and the upper one oval or convex-top, both lying horizontally; I use the upper one for newly cleaned plates, and the lower for buffing galvanized plates, to preserve them for the second coating.

I am now alone in my manipulations, except what assistance I get from a lady pupil; I am making as many pictures as I was three years ago, when I employed three assistants, the average of my work is much better, and it is produced with decidedly more ease than it was then, now I lose no sittings, because my plate is poorly prepared, I see no changable or streaky backgrounds, I find but few poor plates, my camera is good, my iodine is good, my *chloro-bromine* is good, my buffs are good, my mercury is good, and my subject for pictures are all good; but with poorly prepared plates, I might be led to think that all were bad. I have no doubt but that had some daguerreotypist that I could mention prepared my plates for the last year, Scovill and Anthony would have heard my grumbling, as well as theirs; but the state of perfection to which I have brought my apparatus, has destroyed my grumbling propensity, it makes a good plate of a poor one, and produces a similar effect throughout all the process. All of my apparatus, except my camera and coating boxes I invented myself; none of it is patented and all are at liberty to meddle or build after it, if it is worth so doing. I usually manage to keep on hand a quantity of each size of plates, cleaned and once coated with silver, and recoat them, just before using them, and jobs for which I am well paid I buff and coat three or four times, which gives a better finish than only one coating. I use the ordinary dry iodine, English or French. During the cold weather I charge my box with from four, to ten oz.; in warm

weather, I used not to exceed so many pennyweight, but I treat my bromine differently; I use exclusive of all others, the chloro-bromine quick, which is very strong, but may be used during the cold weather without any difficulty. I charge my box with some twelve or fifteen oz. the year round, and in warm weather prevent it from escaping too freely, by covering it over in the box with chloride of lime and common fine salt, equal parts; by this method of treatment, one charge of quick if put in the box at the close of autumn, will last until autumn returns. I use no mercury but that that is double distilled and wash it frequently with dilute nitric acid. My mercury bath is of my own construction, it is cast of iron fourteen inches deep, with an iron rack three inches above the mercury, covered with coarse filtering paper through which the vapor passes; my usual time for mercurializing my plates is three minutes. The chloride of gold that I use is (prepared by the Utica chemical manufacturing company,) chemically pure, that is, free from salt; I prepare my gilding by combining fifteen grains of gold, and eighty grains of hyposulphite of soda with one quart of water; I have not failed in this process, since the organization of the company. Professor Evans can and will produce and reproduce the same thing, or quality of chemical. My reception room is managed by a lady whose business it is to fit the rooms in the morning, keep them in order during the day, wait on company, contract and deliver pictures, keep the books, &c. &c. An accurate account of all jobs done at my place is kept in the following manner, and the book is ruled as follows:—month, date, name, residence, 4-4, 2-3, 1-2, 1-4, 1-6, 1-9, 1-16, locket, dollars, and cents, which renders the book keeping very easy, and enables me to foot up each page in a few minutes, and know the exact number of each size on the page, also the price of each picture and each day's work carried out to be footed when the page is full. My matters are all moving on like clock-work. I look around me and among others of my brothers in art in similar circumstances and I feel contented and happy. Perhaps a word in return to prices, will not be amiss. I am getting an average of \$2,53 for my 1-6 sizes and less

including lockets; \$4,35 for 1-4 sizes, \$8,25 for 1 2; and \$15 for full sizes; this estimate includes groups as well as single portraits. Having already extended my letter beyond my expectations in the outset I will make but a single suggestion and close. The next annual meeting of the N. Y. S. D. A., is to be held in Utica in October next. I hope to see a grand rally as business of decided importance will come before that meeting.

Respectfully yours, D. D. T DAVIE.

Louisville, May 28th, 1853.

MR. EDITOR: DEAR SIR—Your valuable journal has reached us regular since the January Number, and we are very much pleased with it, and hope you will consider us subscribers. The need of such a journal has long been apparent to all who search after a thorough knowledge of photography, and your advantages for requiring such information as the daguerreotypist may require, and all general information appertaining to the business coupled with your happy manner in giving such information to your subscribers, renders the "Photographic Art Journal" above price to the "Fraternity." Your proposition to open your columns to, and asking for, communications from the various parts of the country where your journal reaches, should meet with a "hearty response." Oh! for a more exalted view of the business generally, can you not instill into the minds of all who are engaged in a proper understanding of it? can you not prepare their minds to take in the great truths that will soon become apparent to all observers, that photography is taking a start among the arts of the day, not yet anticipated? You can do this by means of your journal. If it can be done, the tendency to lower prices will be overcome, and real merit receive its reward.

You requested in your last Journal to be informed by all operators who intend to exhibit specimens at "Crystal Palace," of such intention; we cheerfully respond to your request, by saying, that we have been awarded a small space in the Palace, which we intend to fill with specimens of our average work. If we had received notice of our success in getting a space sooner, we would have been better

prepared to make "a show," as it is, we intend to send some specimens of "Kentucky's Illustrious Sons," (as far as we are able to get them,) and you may expect to see nothing but our "every day's work." It is a wrong idea that a man must get the highest prize for one or two fine pictures he may make, when all are liable to make such, with perhaps a better result; let even the commonest operator make one such picture every year for ten years, he will have a very nice collection of specimens to exhibit, in competition with a man who makes a good picture every day, and his chances for being awarded the highest premium on his ten pictures are as good as the operator who makes them daily. This gives the oldest operator the best chances, (with the same facilities) for he exhibits some results taken ten years ago (which, perhaps even himself has not been able to excel since,) in competition with an operator who has had no opportunity to get specimens for such exhibition till within a few weeks.

The first intimations we had, that space had been allowed us in the Crystal Palace, was by a letter from Col. Rand, (Commissioner for Kentucky,) dated from New York on the 20th of April. Our pictures have all been taken since the receipt of that letter, and that too in connection with our trade. We make this statement in order to receive an impartial judgment from our friends at least.

That you may receive the patronage your efforts so well merit, is the wish of your friends
WEBSTER & BROTHER.

— — —
**A SCENE AT SIMONS' DAGUERREAN ROOMS,
RICHMOND, VA.**

A few days ago, a gentleman calling himself Verdant, went into Mr. Simons's, and apparently very much agitated, asked him if he remembered having taken his likeness last week? Upon Mr. Simons replying in the affirmative, Mr. Verdant said, "well, sir, then I am safe; you will now be kind enough to take another for me precisely the same as the first, which I have brought with me for the express purpose of comparison," (taking the picture out of his pocket, and unwrapping it from some half-dozen newspapers, which performance alone occupied at least ten minutes, so

snugly and carefully was it done up) "and nothing short of a fac-simile, a perfect fac-simile," continued he, "will answer my purpose, can it be done?" I will do my best to please you, observed Mr. Simons, as the picture was handed to him. The day is very propitious, and I may make you a better picture, though this one seems faultless—this is one of my happiest efforts, the eyes are exquisite—the hair was even, nothing more perfect—the mouth, how perfect also, yea beautiful—how exquisite—nothing could be truer to the original, and as to the nose—here Mr. Verdant interposed by saying: I expected it, more evidence; I know every body noticed it. Noticed it! repeated Mr. Simons. What do you mean, what do I mean, truly, can you not see what I mean? Do you not see how completely I have been hocused-pocused out of that feature last named—will you pretend, sir, to say, that this is the same nose? pointing to his proboscis, (which by the by, was large enough to supply any moderate family with that article,) that I had when you took my picture last week? examine it, sir, and compare it with the picture you have in your hand. I have, sir, and can see no difference whatever, you certainly have been dreaming. No, sir! I have not, and will now relate all: the truth is, a few evenings ago, through the persuasion of friends, I was induced to witness Mr. Macallister's extraordinary performances, and was foolish enough to allow him to cut my nose off, which he promised to replace just as he found it; this I can prove by the whole audience present on the occasion. Now sir, what is to be done? should such things be allowed in a civilized country—steal a man's nose off his face, before his own eyes? too ridiculous! Why, sir, this is a clear case of procuring goods under false pretences. My original nose was a pure Roman, and in the place of which, he has stuck on to me a common stub! I can't stand it, sir, too bad, sir, too bad, sir, at my time of life to be swindled out of such a prominent feature,—a nose, which every body remarked was a model one; and besides, I had got quite used to it. I could blow it without any difficulty, and I am fully convinced, from the little experience I have had with the new nose, that should I attempt to perform that very essential operation, I should

most undoubtedly blow it off. By this time, Mr. S. finding that a large number were waiting for pictures, and that to listen to this strange man—although highly interesting,—would be at the sacrifice of a day's business, which would be paying too dearly for the joke, he sent immediately for Mr. Macallister, and in a moment, as if by enchantment, this great wizard of the world stood before him, and with but a single hint from Mr. Simons, understood the whole joke. Ah, this is Mr. Verdant, stepping up to that gentleman; my name is Macallister, I have been looking for you all day, and must now beg ten thousand pardons for the blunder I committed in replacing your nose, which I can assure you, sir, was not done intentionally, but was caused by the hurry of the moment, and I did not discern the mistake until I overhauled my assortment of noses, keeping on hand, as I do, a large

number in case of an accident, when I found I was minus one small, and in the place of which I found a most beautiful Roman, which I have brought with me, sir, and will, by your permission, correct my mistake in a few minutes, please take a seat. Mr. Verdant, very cheerfully became seated, when Mr. Macallister immediately commenced one of his inimitable nose amputations, for which he is so far famed, and in a very short time, informed Mr. Verdant that all was right and tight again. No sooner did he receive this joyful information, than he was at the glass, and imagining a great improvement in his physiognomy, he thanked Mr. Macallister for his kindness, and desired Mr. Simons to take two pictures of himself, one for his friend Macallister, the other to be hung up in the gallery; that all might behold the miracles performed by Macallister.

From Notes and Queries.

PHOTOGRAPHIC NOTES AND QUERIES.



E shall under this head, give our readers whatever may appear from time to time, in the London periodical, "Notes and Queries." We should be pleased to continue this series of articles by the addition of similar communications from American artists. We therefore, invite our readers to follow the example of English photographers.

MR. WELD TAYLOR'S PROCESS.

As I presume the object of publishing Photographic Notes, &c., is to aid those who are *not proficient* in the processes indicated, Mr. Weld Taylor must not take umbrage at his first communication being misunderstood, whether unavoidably or wil-

fully, as I am sure the former must have been the case with all novices in the photographic art at least; however, I had no intention whatever of offering any annoyance to Mr. Taylor in my remarks, which were intended solely with a view to produce an effect which has partially been successful, that of exciting a more definite explanation of his meaning. That Mr. Weld Taylor may "enlighten" me is not only possible, but very probable, and I can only say I shall be much obliged to him for so doing.

With reference to his process for iodizing Canson's paper, I presume his meaning to be as follows, viz.: Mix half an ounce of a *forty-grain* solution of *nitrate of silver* with an equal quantity of a *fifty-grain iodide of potassium*, by which a precipitate of iodide of silver will be formed, the supernatant fluid containing the excess of iodide of potassium and the nitrate of

potash formed by the decomposition. *Add drop by drop* a solution of the cyanide of potassium, until the iodide of silver is redissolved, and the liquid becomes limpid, and then *four ounces* more of distilled water, making up five ounces altogether. The paper should then be washed over with the above and *dried*, after which it may be floated on water slightly acidulated with sulphuric acid for a few minutes, and after being again dried, either wholly, or else partially with blotting-paper, may be rendered sensitive with a weak solution of nitrate of silver. Here are two or three points admitting doubt: first, would it not be better to wash away the nitrate of potash and free iodide of potash first, and then dissolve the iodide of silver in solution of cyanide of potassium? Secondly, would not a slight soaking in plain water after the acidulated bath be of advantage? Thirdly, is it better to dry the paper again before rendering it sensitive? and fourthly, what strength of nitrate of silver solution should be used to render it sensitive; and ought it to have any acetic or gallic acid, or both?

GEORGE SHABOLT.

ANIMAL CHARCOAL IN PHOTOGRAPHY.

Perhaps you or one of your photographic correspondents would inform me whether the animal charcoal, recommended for the aceto-nitrate of silver solution, should be used as a filter, or simply allowed to remain in the bottom of the bottle?

A. B. G.

Oxford.

SIR W. NEWTON ON THE USE OF COMMON SODA AND ALUM.

In reply to W. Adrian Delferier, who is desirous of knowing the "*rationale* of the *action* of the *common soda* and powdered alum, &c.," my motive for using *common soda* to cleanse the *negatives* is, that it not only removes the hyposulphite of soda more readily, but any impurities which may be in the paper, as well as the *whole* of the *size*, such being absolutely necessary for the after *waxing* process; which, when done, the negative should appear nearly as transparent as glass.

The reason why I prefer *alum* for the positives is, that while it has the effect of removing the hyposulphite of soda and other impurities in the paper, it does not

act upon the *size*, which in this instance it is desirous to retain.

I have been induced to make a series of experiments, with a view to prevent the *fading* of the *positives*, or indeed, that any portion should be, as it were, *eaten away in parts*; and since I have adopted the foregoing, in no one instance has any change taken place whatever.

6. Argyle street. W. J. NEWTON.

DIFFICULTIES IN PHOTOGRAPHIC PRACTICE.

Having met with some of the difficulties that your correspondent G. H. mentions in his communication (Vol. vii., p. 218.,) I beg to offer a few hints which I think will be of service to those who are trying the waxed-paper process.

With regard to the spots, it is not easy to know whether they are produced by particles of iron in the paper, or by the oxide of silver. Le Gray says: "If spots should form, produced by the oxide of silver, they may be removed by pouring over the negative some acetic acid, and passing a brush lightly over it."

The second difficulty, want of depth of tone or intensity in the negative, may have been caused by too short an exposure in the camera, or not having used the proper proportion of developing solution. Try the following:

4 oz. dist. water.

8 grains gallic acid.

When this solution has been filtered, add to it $\frac{1}{2}$ drachm of the aceto-nitr. of silver solution, and 1 drachm of acetic acid. I have generally put a little acid solution, as recommended by Laborde. It prevents the decomposition of the gallic acid, and renders the image clearer and free from spots. A piece about the size of a pea for four or five ounces of solution.

As to the third difficulty, I believe nothing but replacing the porcelain dishes by glass ones will prevent the dirty marbled appearance in the bottom of the dishes made of porcelain; they are generally rough and even on the surface, and there are often what is called "kiln-cracks" in the angular parts. Two months ago I bought two glass dishes; although they are more than double the price of porcelain, I expect the annoyance of dirty dishes is prevented. The glass ones are made

quite round at the sides and ends, and of course will be easily cleaned. I am informed they are made in France, but they could be had of English manufacture.

The animal charcoal in the sensitive solution must be shaken up in the aceto-nitrate solution; and when it has become quite clear, the solution before using must be filtered into the dish. R. ELIOTT.

Penslur Iron Works.

REPLIES TO PHOTOGRAPHIC QUESTIONS.

Sir William Newton is right respecting the active properties of sulphuric acid; it should therefore not be stronger than merely tasting of the acid; but it has appeared to me to possess a superior effect in setting the alkalis free. I believe muriatic acid would have precisely the same effect, or Beaufoy's acetic acid, though it would be rather expensive. Starch would be invaluable both for positives or negatives, if it could be laid on perfectly even; but if pinned up to dry it all runs to one corner, and if laid flat it runs into ridges. Perhaps some artist may be able to favor us with the best mode of treating starch; its non-solubility in cold water makes it an invaluable agent in photography.

The above includes a reply to Mr. J. James' first query: to his second, the solution may be either brushed or floated, but all solutions require even greater care than doing a water-color drawing, to lay them perfectly flat. The remaining questions depend for answer simply on the experience of the operator: the bringing out, exposure in the camera, &c., have been so clearly described lately by Dr. Diamond, it would be useless to give further directions at present.

G. H. should dispense with the aceto-nitrate and gallic acid, and bring up with gallic and glacial acetic acid only. This makes no dirt whatever, and is quite as effective. This marbling he alludes to proceeds from the sensitive solution not being sufficiently dry when put into the camera. Even if prepared paper is blotted off, which I think a very bad plan, it should have some time allowed it to dry; also the faintness of the image depends either upon not giving time enough, or the aperture he uses for his lens is much too large; or again, he has not found the true chemical focus,—it varies in single menis-

cus lenses sometimes as much as three-eighths of an inch nearer the eye than the visual;—all these are causes of indistinct images, and require patience to rectify them.

I beg leave to subscribe entirely to Mr. W. Brown's remark on the subject of Mr. Archer and collodion. I have one of Mr. Horne's handbills, circulated with the first samples of collodion, headed "Archer's prepared collodion" in 1851, and had some of the earliest in the market. That Mr. Archer should fail in trying his own preparation goes for nothing at all, because, at the best of times, and with the most skillful, failures are often numerous and mortifying, in photography above all other arts; therefore, unless some more correct data are given, the merit rests entirely on Mr. Archer. WELD TAYLOR.

Bayswater.

DEVELOPING PAPER PICTURES WITH PYROGALLIC ACID.

(Vol. vii., p. 117.)—Your correspondent R. J. F. asks if any of your photographic correspondents have developed their paper negatives with pyrogallie acid. I have long been in the habit of doing so by the following process. Of Mr. Archer's developing solution, viz.,

Pyrogallie acid..... 3 grs.

Acetic acid 1 drachm.

Distilled water 1 oz.

take twenty grs. (minims): add an equal quantity of distilled water, and five drops (minims), of acetic acid. I pour the mixture upon a glass plate, and put the sensitive surface of my picture upon it; moving it up and down by one corner, to prevent the paper being stained, and to observe the development of the picture; which, when sufficiently come out, I blot and wash immediately, and fix with hyposulphite of soda or bromide of potassium.

Manchester.

THOMAS WYATT.

PHOTOGRAPHY IN THE OPEN AIR; IMPROVED CAMERA.

In your number 172, p. 163., there is a note of mine in reference to the use to which thin sheet India rubber might be applied. I there alluded to the difficulties attending a single "portable camera," in which all the coating, developing, &c. of your plates is to be done; and for those

gentlemen who have the means of carrying about with them a second box, I have devised a modification of Archer's camera, which, I think, will prove very useful. It is one which I am about to make for myself. This second box is one in which, when traveling, I can pack my camera, frames, glasses, and chemicals. Having arranged your camera, you proceed to arrange the second box, or "laboratory." This laboratory has three short legs, which screw, or fasten by any simple contrivance, to it, so that it may stand a sufficient height from the ground to allow the bath, which fits in like the one in Archer's camera, to hang beneath it, and also that when working you may do so with ease. It is lighted by either yellow glass or India rubber. There are sleeves of India rubber for your arms, and the holes in the sides of the box traverse nearly the whole of the sides, for the purpose of moving your hand freely from one end of the box to the other; there is also an opening for the head. The bottom of the box is divided: about two-thirds of it, and that nearest to you, has a gutta percha tray, with the four sides, three inches high, fitting it quite tight; and in one corner a tube a few inches long, also of gutta percha, fixed to it, and passing through the bottom of the box, to allow the refuse washings to run off. In the middle of this tray a developing stand of gutta percha is fixed to the bottom, on which to lay the glass plates. The other one-third of the bottom of the laboratory is fitted thus;—There is a slit across the box, immediately before the wall of the tray, for the nitrate of silver bath to slip in. Immediately beyond the edge of the bath is a small fillet of wood running across the box parallel with the bath, and so placed that if the bottom of the dark frame to contain the glass plate is rested against it, and the top of the frame rested against the end of the laboratory, the frame will slope at about an angle of forty-five degrees. Let there be a button, or similar contrivance, on the underside of the lid of the box, that the lid of the dark frame may be fastened to it when open. Bottles of collodion, developing fluid, hyposulphite of soda, or solution of salt, &c., may be arranged in various convenient ways within reach. The proceeding then is very easy. Place the bath-frame and bottles in their

places; rear the glass plate in the frame; shut the laboratory lid; place your hands in the sleeves and your head in the hood; fix the door of dark frame to the top; coat the plate; place it in the bath with collodion side from you (it will then be in a convenient position when you draw it out of bath to place at once in the frame); fasten the frame door; open the box lid; remove to camera; after taking picture, return frame to its place in camera; bring the plate to developing stand; develop; pour solution of salt over; remove from box; finish outside with hyposulphite of soda.

I have been thus explicit to render the matter as plain and intelligible as possible without aid of diagrams. But I shall be happy to give any one any further information, either privately, or through "N. & Q." It seems to me that by this contrivance you simplify the process as much as is almost possible; you keep separate the different processes, and run little or no risk of mixing your chemicals, a misfortune which would spoil several hours' work, as well as entail a considerable loss of materials. The box would be no expensive article; any one possessing a little mechanical skill could construct it for himself, and its use as a packing-case for your apparatus would repay the cost.

I have for some time been using a developing fluid, which appears to have some desirable qualifications; for it is simple, inexpensive, and keeps good, as I have tried it, for a very long period. I have worked with it when it has been made ten weeks; it slightly changes color, but it throws down no deposit, and does not ever stain the film; when first made, it is colorless as water. Dr. Diamond has kindly undertaken to test its value, and if he pronounces it worthy of being made known, the readers of "N. & Q." shall shortly have the benefit of it. J. L. Sisson.

Edingthorpe Rectory, Norfolk.

NEW EFFECT IN COLLODION PICTURES.

In the course of some experiments I have been following in reference to a photographic subject, a method by which a new effect in pictures on glass may be obtained has occurred to me. Such productions, when treated as positives, are of

course white pictures upon a black ground ; and although for beauty of detail they are superior to those belonging to any other process, there is a certain harshness and want of artistic effect : to remedy this, I turned my attention towards obtaining a dark picture upon a light ground, as is the case when glass photographs are painted from ; in this I have succeeded, and as the modification affords a pleasing variation, it may be acceptable to the tastes of some of your readers. The principle I proceed upon is to copy, by means of the camera, from a previously-taken picture in a negative state. Suppose, for instance, our subject is an out-door view : I take a collodion picture—which would answer for a positive if backed with black : this, viewed by transmitted light, is of course negative, —an effect which may be produced by placing a piece of white paper behind it from this *white-backed* plate : I take another collodion picture, which, being reversed in light and shade, is negative by reflected light ; but viewed as a transparency is *positive*, and of course retains that character when backed with white paint, paper, or other substance lighter in color than the parts formed by the reduced silver. Instead of the first picture being formed by the glass, any of the paper processes may be adopted which will afford negative pictures. Copies of prints may be beautifully produced on this principle by obtaining the first or negative by the ordinary process of printing. As these pictures are to form a contrast with a white ground, they should be as brown in tint as possible ; nitric acid, or other whitening agents, being avoided in the developing solutions for both negative and positive. By this process the detail and contrasts can be kept far better than by the operation of printing : for it is exceedingly difficult to obtain a picture which will convey to the prepared surface an amount of light corresponding to the natural lights and shades, and the trouble of making collodion copies is far less than printing. There is certainly the drawback of having the copies upon glass : I think, however, that some white flexible substance may be found, upon which the collodion, albumen, &c, may be spread ; but if they be intended for framing, of course they are better on glass. The general effect is

that of a sepia drawing. The picture first taken and used as a negative, may be preserved as a positive by removing the white back, and treating it in the usual manner.

Permit me to observe, that much confusion arises from the *manner* in which the terms positive and negative are often used ; a negative glass picture is frequently spoken of as a definite, distinct thing ; this is not the case, for all photographic pictures upon glass are both negative and positive, accordingly as they are seen upon a back of lighter or darker shade than the reduced silver—by transmitted or reflected light. A picture intended to be printed from is no more a negative than another, its positive character being merely obscured by longer exposure in the camera. When first removed from the developing solution, glass pictures are negative, because they are seen upon the iodide of silver, which is a light ground. This is a thing of course well known to many of your readers, but beginners are, I know often puzzled by it. WM. TUDOR MABLY.

Manchester.

POWDERED ALUM—HOW DOES IT ACT ?

Sir W. Newton has again kindly informed me of *his motive* for using the powdered alum, which in "N. & Q." (Vol. vii., p. 141,) he asserts readily removes the hyposulphite of soda. What is the *rationale* of the chemical action upon the hyposulphite of soda ?

W. ADRIAN DELFERIER.

40 Sloane Square.

ECONOMICAL WAY OF IODIZING PAPER.

The extravagant price of the salt called iodide of potassium has led me to experiments as to whether paper could not be iodized in another form ; and having been successful, I offer the process to the readers of "N & Q." Having verified it three times, I can safely say that is quite as effectual as using the above salt.

The first solution to be made, is a saturated solution of iodine. Put about sixty grains of iodine (the quantity is not of importance) into an ounce bottle, and add proof spirits of wine ; set it near the fire "on the hob ;" and when it is nearly boiling, agitate, and it will soon become a concentrated essence ; take now a bottle

of clear glass, called a quart bottle, and put in it about two ounces of what is called carbonate of potash (nothing more than purified pearlash); fill up with water to within an inch of the neck, and agitate; when it is dissolved, add any of the other approved sensitives, in discretionable doses, such as fluoride or bromide of potassa, ammoniac salt, or common salt—it may have about sixty grains of the latter; and when all are dissolved, add the iodine. This is added by degrees, and shaken; and when it is a pale yellow, it may be considered to be ready for iodizing; from some experiments, I am led to believe that a greater quantity of iodine may, if necessary, be added, only the color should not be dark. And should the operator reach this point, a few drops of solution of cyanide of potassium may be added, until the pale color returns. Bromine water I believe may be added, but that I have not used hitherto, and therefore cannot answer for its effects. The paper then having its usual wash of nitrate of silver, is then floated on the solution about one minute, and the accustomed process gone through as described by most photographers. It is only disposed to require a pretty strong solution of silver, say thirty grains to the ounce of water. This I attribute to the potash being in a little more caustic condition than when recrystallised with iodine. And the only difference in the above formula between the two states is, that the iodine in the medical preparation is incorporated by means of iron filings with the water, which I only interpret into being a cheaper method; which makes its high price the more scandalous, and I hope this method will save photographers from the imposition; the price of a quart of iodide of potassium would be about six shillings, by the above about ten-pence. And I can safely say, it is quite as effectual; theoretically, it appears to be better, because iodine is exceedingly difficult to preserve after being dissolved and recrystallised. And much of it is lost in the preparing iodized paper; as, for instance, the usual way generally requires floating on free iodine at the last; and with the formula here given, after using once, some small quantity of tincture of iodine should be added before putting away, as the silver laid upon the surface of the paper absorbs more of the

iodine than the potash. Therefore, a very pale yellow may be its usual test for efficiency, and the equivalent will be maintained.

N. B.—Potash varying much in its alkaline property, some samples will remain colorless with addition of iodine; in which case the judgment must guide as to the quantity of iodine. It should not exceed the ounce of tincture; about two drachms may be added after using it for paper.

WELD TAYLOR.

7, Conduit Street West.

QUERIES ON SIR W. NEWTON'S PROCESS.

The process of SIR W. NEWTON is nearly similar to one I have successfully used for some years, and I can recommend it as effective and simple.

A difficulty I have lately found, has been with my iodized paper, which, when freshly used, is well enough; but if kept a month or two, will only allow of the paper being prepared to take views just before using. I should much like to know how this occurs.

If SIR W. NEWTON would answer the following Queries, he would add to the obligations that many others besides myself are under to him.

1. What paper does he use for positives, and what for negatives?

2. Is it not better to dissolve the silver and iodide of potassium in three ounces of water each instead of one (see "N. & Q," Vol. vii., pp. 151. 227.)?

3. Is spring water fit for washing the iodized paper; if it contains either sulphate or bicarbonate of lime or muriate of soda?

4. How long ought the iodized paper to keep good?

5. How long should the negative paper (on a moderate warm day) keep after being made sensitive, before exposing to the action of light; and how soon after that should it be developed?

JOHN STEWART.

Brighton.

SUGGESTION TO PHOTOGRAPHERS.

The Rev. Chas. Forster, in his *One Primeval Language* (p. 96,) speaks of the desirableness of obtaining copies of two great inscriptions in the Djebel Mokatteb, —one in forty-one, the other in sixty-seven lines, supposed to have been written by the Israelites during their exode. In the words,

however, of the Comte d'Antraigues, which he quotes in p. 84. : "Il faudroit six mois d'un travail opiniatre, pour dessiner la totalite de ces caracteres." Is not this a temptation to some of your photographic friends, who may be turning their steps to the East during the ensuing season, to possess themselves of a treasure which by the application of their art they might acquire almost in as many minutes?

VERBUM SAT.

PHOTOGRAPHIC GUN-COTTON.

The "doctors differ" not a little in their prescriptions for preparing the best gun-cotton for photographic use. How shall the photographer decide between them?

DR. DIAMOND ("N & Q," Vol. vi., p. 277.) says (I quote briefly), "*Pour upon 100 grains of cotton, an ounce and a half of nitric acid, previously mixed with one ounce of strong sulphuric acid. Knead it with glass rods during five minutes,*" &c.

Mr. Hunt, quoting (apparently with approbation) from Mr. ARCHER, says (p. 260, 3d edit.), "Take one ounce by measure of nitric acid, mixed with one ounce by measure of ordinary sulphuric acid, and *add to them* eighty grains of cotton; well stir," &c. *for not more than FIFTEEN SECONDS*, &c. "It will be seen that the cotton is not exposed to the action of the mixed acids in this last mode longer than is necessary to saturate the cotton; should the action be continued further, the solubility of the cotton is entirely lost."

Not only is the order of manipulation different (a point probably not material), but the time between "five minutes" and "fifteen seconds" must exercise a most important influence on the result. Who is right?

COKELEY.

SEALING-WAX FOR BATHS.

I notice in your answers to correspondents (No. 176., p. 274) that you inform H. HENDERSON that glass may be cemented for baths with sealing-wax. May I recommend to H. HENDERSON the use of gutta percha, instead of glass for that purpose? Sheet gutta percha is now very cheap, and the baths are most easily made. I have had one of my own making in constant use since last July, having never emptied it but twice, to filter the nitrate of silver solution. It is not liable to break-

age. And when it is necessary to heat slightly the silver solution (as it has been during the late cold weather), I have adopted the following simple plan: Heat moderately a stout piece of plate glass; plunge it into the bath; repeat the operation according to size of bath. It is very useful to make a gutta percha cap to cover over the bath when not in use; it protects it from dust and evaporation, and saves the continual loss of materials arising from pouring the solution backwards and forwards. For home-work I have reduced the whole operation to a very simple system. My bath, hypo-soda, developing fluid (of which, as it keeps so long, I make ten ounces at a time), are always ready in a small closet in my study. These I arrange on my study-table; a gutta percha tray, a brass levelling-stand upon it, a jug of soft water, and half-a-dozen small plates to place my pictures on, after treating them with the hypo-solution (for, to save time, I do not finish washing them until I have done all the pictures I require). All these things I can prepare and arrange in less than ten minutes, and can as easily return them to their places afterwards.

With regard to Mr. Mabley's process, described in "N. & Q.," No. 176., p. 267., as I am but a beginner myself, and have much to learn, I should be sorry to condemn it; but I should fear that his pictures would not exhibit sufficient contrast in the tints. Nor do I see the advantage the pictures would possess, if they did, over positives taken by our process. We amateurs in the country, labor at present under great disadvantages, some of which I think the Photographic Society will remove. I am myself quite unable to form an idea what the collodion pictures done by first-rate photographers are like. All the positives done by amateurs in this part of the world, and developed by pyrogallie acid, which I have seen, present a dirty brown hue, by no means pleasing or artistic; and I have seen but very few either developed by pyrogallie acid or protosulphate of iron, free from blemishes. I think if we were to act upon the suggestion made in "N & Q." some time back, and send the editor a specimen of our performances, it would be a slight return for his endeavors in our behalf; and he would, I doubt not, honestly tell us whether our

pictures were tolerable or not. I, for one, shall be very happy to do so.

J. L. SISSON.

Edingthorpe Rectory.

THE BLACK TINTS ON PHOTOGRAPHIC POSITIVES.

A correspondent having inquired how these were obtained, and another replying that it was caused by starch, I beg to offer a process to your readers as to how they may obtain those carbonic tints; though I must promise that the process requires some skill, and is not always successful, though always sure to make them black: but on occasions of failure the lights sink, and the brilliancy of the picture is lost. That it is not starch in the French process, unless that vehicle contains some preparation, I am tolerably certain; the chloride of barium will often produce black images, though very uncertain; and the black process as given by Le Gray is uncertain also. For myself, I generally prefer the color given by ammoniac salt; it is artistical and sufficient for any purpose. The present process, which I use myself when I require a black color, with its imperfections, I offer to the photographic readers of "N. & Q." and here it is.

Take a two-ounce vial, and have some powdered litharge of lead, by some called gold or scale litharge; pound it fine in a Wedgewood mortar, and put in the vial about one scruple; pour on it about half an ounce of Beaufoy's acetic acid, but do not replace the cork or stopper, as the gas evolved is very active, and will burst the vial, placing the operator's eyes in jeopardy; agitate and allow it to stand some hours to settle, or leave it till next day, when it will be better for the purpose: then decant the clear part and throw the fæces away, return the solution into the bottle, and fill up with distilled water. The positive paper being now prepared with the ammonio-nitrate of silver, and placed as usual in the sun, the artist must remove it when a tolerably distinct image is visible, but not altogether up: this is one of the niceties of the process; if it is too much done the blacks will be too black, and if not enough they will be feeble and want richness; it is when a visible image of the whole is developed: at this point

put the positive into cold water; this will remove a great deal of the silver that has not been acted upon by the light: let it soak three or four minutes; take it out and blot off the water, laying a clean piece of paper below. Now pour a small quantity of the solution of lead on one end, and with a glass rod pass it carefully over every part; blot it off, and giving the paper a little time to dry partially, pass over a solution of newly made gallic acid; the shadows will rapidly become perfectly blank, and the picture will come up. But another nicety in the process is the point at which it must be plunged into hyposulphite of soda solution; if plunged in too soon the black will be mingled with the sepia tints, and if too late the whole tint will be too black. I offer it, however, because I know its capabilities of improvement, and the intensity of the black is sometimes beautiful: it is better suited for architectural subjects, where there is but little sky, as it will lay a fair tint over it; but if a sky is attempted, it must be kept under by a brush with a little hyposulphite of soda solution, touching it carefully. The time it will take in becoming black will not exceed one minute; but as the eyesight is the guide, the moment the tints have changed from red to black is the proper time to arrest its further progress: the combination thus obtained will not change, nor, I believe, become faint by time; but I repeat it may be much improved, and if any abler hand, or one with better means at his disposal, will take the trouble to examine its capabilities, I shall be very thankful for his notes on the subject.

N.B. The solution of lead must contain acid: and if by keeping it does not change litmus-paper, acid must be added till it does.

WELD TAYLOR.

7 Conduit Street West.

DEVELOPING CHAMBER.

I think Mr. Sisson will find some difficulty in applying his very excellent idea of a sheet India rubber lighting medium to his portable laboratory, as the vapor of the other will act upon it and render it sticky and useless after one or two usings. Allow me to suggest what I am in the habit of using, viz. a double layer of yel-

low glazed calico, stuck together with a common drying oil, and allowed to dry for a few days: this causes a perfect exclu-

sion of the actinic rays, and is very durable.

F. MAXWELL LYTE.

Falkland, Torquay.

A GENERAL REVIEW OF THE DAGUERRETYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

CHAPTER XIII.—CONTINUED.

PHOTOGRAPHY ON PAPER.



HUS far we have reasoned as though the paper were composed only of ligneous fibres placed in juxtaposition without anything intervening as is the case with unsized paper; but

the necessity of submitting the sheets to multiplied and prolonged washes does not allow the employment of unsized paper, it is precisely this sizing which, by its nature and unequal distribution, renders the choice of the paper so difficult.

The sizing, is in fact, a sort of pasting which serves to unite the ligneous fibres, and is detrimental, in principle, to the equal distribution of the chemical preprecipitate, this effect is especially perceptible on negative paper, where the least inequality expresses itself by an imperfection in the image; this is why it has been incessantly sought to substitute for the paper continuous membranes deposited on the surface of thin plates of glass, as we shall hereafter describe.

To sum up all, choice should be made of paper possessing the finest qualities, of a beautiful white, having some body and two lines in thickness; the finest for the negative and the thickest for the positive proofs. Cases of thick white bibulous paper should also be procured, which will be previously marked for one particular purpose; three will be necessary; the first for paper

steeped in the chloride of sodium, the second for papers imbued with the iodide of potassium, and the third for both positive and negative proofs after being plentifully washed with water.

GENERAL OBSERVATIONS.

Photography on paper is still at the present day impeded by a host of superfluous precautions which causes the loss of much time and occasions useless expense; such, for instance, is the exclusive employment of distilled water advised by certain operators. With a little reflection it will be perceived that the use of distilled water should be limited to the employment of the iodide of potassium, nitrate of silver and the acetic and gallic acids, every where else it is perfectly useless.

The use of bottles of *blue* glass, to prevent the salts of silver from decomposing in the light is foolish in the extreme, for it is well known that blue rays are essentially photographic and cannot fail to act in almost the same manner as white light. It is infinitely better to place each bottle in a pasteboard case as is done by Mr. Cœulte. This extremely simple method is much more efficacious, and, at least, allows one to judge at the first glance of the state of the liquid within by drawing the bottle from its case.

Every sheet or proof having been dried, should be washed with the greatest care in ordinary water, for the soluble salt remaining would tend, in the end, to modify the fixed body; for this reason: all the agents which form with the nitrate of silver insoluble precipitates, susceptible of blackening

* Continued from page 360, vol. 5, No. 6,

on exposure to the light generally dissolve these very precipitates not blackened or they discolor them after their blackening when they predominate; for this reason, chlorine, bromine, cyanuret, hyposulphite of silver, etc., are more or less soluble, in the precipitate state, unchanged by the light, or discolored *more or less*, after their being blackened by the light, by chlorohydric acid, ioduret of potassium, chloride of sodium, bromide of potassium, hyposulphite of soda and cyanuret of potassium even discolors rapidly and totally the precipitates already blackened, as we shall see in speaking of the positive paper of Mr. Verignon.

When the ioduret of silver is to be worked with, it is important that the ioduret of potassium be free from chlorine and bromine, if it be desired that the ioduret of silver may preserve its unchangeable character on exposure to light; for the same reason it is necessary in this case to shun the use of ordinary water, which always contains the chlorides.

When the paper is covered with a fresh precipitate, it is incorrect to place it immediately in the blotting case; this measure is almost always sure to remove in different portions of the paper the artificial precipitate; after the drying of the paper and a fresh imbibition in water, the effect is different; all the insoluble particles will have been solidly fixed upon it by the drying.

For the preparation of positive papers it is really childish to confine one's self to moistening the sheets with salted water on one side only, and one at a time, as is advised by M. Blanquart Evrard; it is much more expeditious and just as well to wet them *en masse* as is the practice of Mr. Bayard who certainly has proved it in his photography on paper; for the insertion of the sheets in the blotter equalizes everything, and the wetting of a single side may, on the contrary, produce grievous inequalities.

PRIMITIVE PROCESS OF MR. TALBOT.

This process has been greatly modified since its publication, but its principle is always recognized in the methods which have prevailed since then.

With a very soft brush, kept exclusively for this purpose, he covered the sheet of

paper, previously marked with a pencil on one of its angles, with a solution, No 1, composed of

Nitrate of silver... * 65 grammes
Distilled water 10000 grammes.

After having dried this paper in the dark he placed it on the marked side over a bath No. 2, composed of,

Ioduret of potassium 65 grammes
Distilled water 1000 grammes

He left it there a minute or two, after which it was plentifully washed with water, placed between a number of sheets of bibulous paper, dried and protected from the light, to be used when needed.

This ioduretted paper was susceptible of indefinite preservation; I even believe that the light did not change it; for I have been able to work with sheets which were given me by Mr. Talbot, although I had kept them entire months, without protection from the light.

As a proof of this fact, after having prepared a large number of sheets, according to this formula, but without employing the brush, I was greatly astonished on finding them all sullied with a brownish marbling as soon as they had received the impression of the light, did this arise from some trace of the acetate of silver left in the sheets, or was it produced by the presence of chlorides or bromides in the ioduret? This I have not investigated.

The appearance of these papers showing me two distinct shades, one, the general yellow, and two other slightly brown and in different portions, excluded the intervention of the reducing salt of silver, which might have produced a homogenous shade. It would be well, therefore, to avoid this disadvantage, if it were wished to prepare ioduretted paper and to dry it in full light, to become assured that the ioduret is free from chlorine and bromine, by observing if a slip of paper plunged successively in solutions Nos. 1 and 2, undergoes the action of the light without changing its yellow shade.

To produce a proof, it was necessary to spread with another brush, upon the ioduretted surface a mixture of the following solutions in equal bulk, No. 3.

* 1170 grains and 18000 grains.

Nitrate of silver	4 grammes	- 72 grains.
Distilled water	40	„ 720 „
Concentrated acetic acid		
.	6	„ 108 „
	50	

No. 4.

Concentrated gallic acid 50 - 900 grains.

100 - 8800 grs.

that is to say the same number of cubic *centimetres* measured with a small vessel, and at the very moment of using it, in order to avoid the decomposition of this mixture which takes place in a very short time.

Mr. Talbot has given to this mixture the appellation of *gallo nitrate of silver*. After having spread it with the brush he left the paper for a few minutes to imbibe the moisture, he dipped the sheet in the water and partly dried it in the blotting case; lastly he placed the sheet while still damp upon a wet slate and exposed it in the camera.

To bring out the image, gallic acid was again spread on the sheet with the brush and the image gradually appeared, and still more rapidly by the aid of heat. Lastly, Mr. Talbot fixed his negative proof by steeping it a long time in a solution, No. 6, composed of

Bromine of potassium*	 25 grammes
Distilled water†	 1000 „

and he afterwards employed it in the production of negative proofs on paper with the chloride of silver.

PROCESS OF M. GUILLOT-SAGNES.

To work by the method of Mr. Talbot it was necessary to prepare ioduretted paper, which was imbued with a re-agent at the moment of exposition in the camera. This is the process followed by Mr. Blanquart Evrard in the production of his first proofs, which have, as he himself justly says, brought to light in France the primitive process of Mr. Talbot. The ioduretted paper might be prepared a long time in advance if all the required regulations were attended to; but the action of the salt left in the constitution of the paper on the surrounding dampness constantly tended to deface this ioduretted paper. It

was at this time that Mr. Guillot Sagnes invented a simplifying method which, at one blow rendered the paper infinitely more stable, did away with one operation, and procured definitely a greater sensibility.

Instead of placing the paper impregnated with the ioduret of potassium in contact with the nitrate of silver, in order to afterwards dry it and impregnate it with the aceto nitrate of silver at the moment of exposure, M. Guillot Sagnes conceived the fortunate idea of suppressing the first pass of the simple nitrate of silver, and to steep the paper in the ioduret of potassium with the aceto nitrate at the moment of placing it in the camera, thus producing at the same stroke an ioduret of silver in the primary state, with an excess of acidulated acetate of silver, which united all the requirements of great sensitiveness to light.

Mr. Blanquart Evrard plunges the paper into a saturated solution of ioduret of potassium, while Mr. Le Gray puts in but 15 or 20 †grammes of the ioduret; this shows that a great latitude is allowed in the proportion. It is true that Mr. Evrard is not tardy in informing us that it is necessary as soon as the sheet has been steeped in the liquid, to rinse it briskly with distilled water; it is impossible for this manipulation to give uniform results. Mr. Evrard operates, doubtless, in this way in order to form the negative proof as he himself says, through the whole depth of the paper; yet M. Le Gray, who applied the ioduret on his waxed paper, seemed to prove that Blanquarts' theory had no foundation. However this may be, it results from the comparison of these two receipts that the solution of ioduret of potassium may contain from 15 to 50 §grammes of the ioduret to a pint of ordinary water, for unprepared paper. This paper, which is also styled *ioduretted*, after drying, may be preserved an indefinite period, placed out of the influence of light and dampness.

Neither are there fixed rules for the use of the acid nitrate of silver for moistening the ioduretted paper; it is sufficient that it contain enough of the salt for giving a heavy ioduret precipitate, and that

* 450 grains. † 18000 grains.

† From 270 to 360 grains.

§ From 270 to 900 grains.

the acetic acid predominates sufficiently ; this liquid is ordinarily composed of :

Nitrate of silver crystalized	
or liquid	1 part.
Distilled water	10 parts.
Concentrated acetic acid	2 parts.

This mixture keeps very well protected from the light, but before using it the necessary quantity should be poured into a glass vessel standing on feet and provided with a spout, and it is also necessary to be assured of its clearness ; at the least appearance of pellicles, it must be filtered through paper or cotton before use.

Mr. Talbot placed this aceto nitrate, having added thereto a little gallic acid, upon the surface of the paper with a brush ; the gallic acid has since been suppressed, which is merely employed for bringing out the impression after exposition in the camera.

The application of this liquid to the ioduretted paper is one of the greatest difficulties of photography, when economy is aimed at ; this is the reason why it is generally deemed sufficient to pour a light layer on the surface of a piece of thin glass, in order afterwards to apply thereto the sheet of paper.

Greater success was obtained by using a small basin containing aceto nitrate of silver one *centimetre** in depth, it is more easy in this manner to avoid the bubbles of air and to drive them off.

The employment of the basin has generally prevailed, and all the more so from the fact that the process of Mr. Talbot is always more useful for amateurs who cannot make an extravagant outlay in their preparations &c., for this reason there is no intermediate method of much advantage between the employment of the brush of Mr. Talbot, and that of the basins plentifully filled with the liquids.

The bath of the ioduretted paper takes place necessarily in the dark by the feeble rays of a simple taper, the duration of this bath is variable, in proportion to the thickness and porosity of the paper, it should remain in it a few minutes at least ; the requisite to be fulfilled is that the aceto-nitrate has affected every fibre impregnated with the ioduret of potassium, a requisite

which is often deemed fulfilled when the paper appears to be wet through.

By this operation there is formed a netting of the ioduret of silver in its primary state, which lies in a mean liquid composed of a solution of *acid* nitrate of silver ; the important object is to preserve this favorable condition during the exposition in the camera. Mr. Blanquart advises the placing of the sheets thus prepared between two plates of glass ; this method requires so much precaution that no one employs it. It is held sufficient to place the paper upon a plate of glass or slate, taking care that the surface be perfectly even, and that the acidulated side be turned outwards facing the object glass.

The pure and simple application upon a wet glass or slate is sufficient for all. There are writers who talk of paper moistened with water ; all which is perfectly useless, since it is said that the bath immediately precedes the exposition in the camera, there can be no question about delaying this exposition so as to allow the moistened paper to dry upon the glass.

On removal from the camera a concentrated solution of gallic acid in freshly filtered distilled water is rapidly poured upon the proof. If the paper is pasted on slate it becomes difficult to watch the gradual birth of the picture ; for this reason it is more advantageous to use a plate of glass, which allows of the light of a taper beneath. As soon as the proof has reached the right point which may be known by the intensity of the blacks, it is plunged with its support into a basin filled with ordinary water, which detaches the sheet. This operation is renewed a number of times in order to remove as far as possible the salt of silver and the acids.

By thus operating, nothing but the separated black compound and the old and the fresh precipitate, unchanged by the light, are left upon the paper, which are yet to be dissolved in order to fix the proof. This is done by plunging the sheet separated from its support into another basin containing a very weak solution of bromide of potassium or hyposulphite of soda. The chloride of sodium (marine salt) may also serve the same purpose—it is less energetic. In order to prepare the solution it is sufficient to put into a funnel, the bottom of which is filled with cotton,

* About 39-100 of an inch.

a handful of grey salt with ordinary water. After a quarter of an hour's immersion the proof may be examined in the light, that is if the larger portion of the precipitate has then been dissolved, and the portion remaining becomes reduced by the dissolvent by the aid of a feeble light.

The bromide of potassium is used in doses of from 25 to 50 grammes* to a pint of common water. The hyposulphite is much more energetic, it is used in the same proportion as the bromide of potassium.

While the negative proof remains in the bath it is taken out from time to time, to ascertain the dissolving of the precipitate by the liquid throughout it; lastly, when in the clear portions the paper seems freed entirely from it, the sheet is first rinsed under a small jet, it is then placed in a large vase filled with ordinary water, which concludes by cleansing it of every soluble salt. It remains but to dry this negative proof by placing it in a press between a number of sheets of bibulous paper.

NEW POSITIVE PAPER.

The positive paper generally employed has for its base the chloride of silver. With this paper the image is allowed to take every intensity of which it is susceptible, which often requires many hours.

M. Blanquart Evrard has pointed out a process of obtaining positive proofs with extreme celerity, but the preparation of the paper and its use are extremely complicated and very expensive. Having to study this operation, I recollect a receipt published some eight or nine years since which I then favored for producing negatives; I was desirous of seeing if it would serve also for positive paper.

The thing has not been as simple as one might imagine; for having, by numerous trials, desired to produce a picture even in direct light, I had always run aground; it is true I was working hastily at the time, only simple sketches for friends; the fact is I obtained absolutely nothing. Yet I had once succeeded in taking very excellent negatives on paper in as short a space of time as on albumenized glass.

The reason of these failures arose from the fact that I had acted on a false theory; in a word, I did not at all understand the

essential requisites while deeming myself master of them.

By the successive employment of chlorohydric acid and nitrate of silver, a chloride of silver is certainly formed, and, after exposure in the camera, the protosulphite of iron continued the decomposition of the salt of silver. I think I remarked that the nitrate of silver should be entirely *neuter*, that is to say, previously liquified; at least, so I employed it; but I was entirely mistaken in the character of the chlorohydric acid, and the condition of the protosulphite of iron.

FIRST REQUISITE.

The nitrate of silver must be employed *acid*, this is requisite to success—and this was the character fulfilled by the chlorohydric acid—for I found that the acetic acid succeeded perfectly.

SECOND REQUISITE.

The iron should not only be in the protosulphite state, it is necessary that its solution be acidulated with sulphuric acid, and iron or zinc should be placed at the bottom of the vessel to constantly disengage hydrogen gas.

In principle this was my manner of proceeding, but I only thought of keeping the iron in the protosulphite state, whilst I found by special experiments that it was necessary the water should be *charged* with hydrogen gas.

THIRD REQUISITE.

To obtain the darkest tone, it is necessary that the prepared paper has taken in the light, a scarcely *visible* tint.

FOURTH REQUISITE.

It is indispensable that the surface of the bath of sulphate of iron be kept pure, that is to say, that it is used freshly filtered, to avoid the pellicles of the precipitate of silver, which fastening themselves on the surface of the paper would infallibly produce blemishes.

BATH OF PROTOSULPHITE OF IRON.

Put into a vessel of glass or earthenware, or still better of brass—

Ordinary sulphate of iron...20 parts
Common water.....100 parts

* 450 to 900 grains.

Sulphuric acid.....5 parts

If the vessel is of glass or earthenware, throw in a piece of iron or zinc ; if, on the contrary it is of brass, no iron need be put in.

This done, hydrogen gas will be disengaged, and the bath will be ready for use, when it is perceived that a slip of paper freshly coated with *neuter* nitrate of silver, takes immediately a beautiful black color : then a certain portion is to be filtered for use.

ACIDULATED NITRATE OF SILVER.

Nitrate of silver.....10 parts

Distilled water.....150 parts

Acetic acid.....5 parts

Or yet again :

Nitrate of silver.....10 parts

Distilled water.....150 parts

with an addition of ammonia by drops until there is a decided appearance of the brown precipitate of the oxyde of silver, which is afterwards dissolved with excess of acetic acid.

TO BE CONTINUED.

From the Scientific Daguerrean:

PICTURE MAKING.—No. V.

BY D. D. T. DAVIE, PHOT.



TTITUDE and dress in portraiture, are pleasing subjects for reflection or study. There is not another link in the whole Photographic chain which is so unbounded in its

range of study, and so gratifying and elevating to the mind of the true artist, as that of attitude. Not all, however, who claim to be artists enter into the spirit of this part of picturing, nor can they, for Nature has never endowed them with a gift so to do. For one to attempt any of the fine arts without a natural talent for that which he attempts, such a move is unwise and will result in disappointed hope ; this is according to the past experience of all nations. I am aware that daguerreotyping has been almost universally regarded as a mere chemical and mechanical operation ; it is this false impression that has called so many uneducated and miserable manipulators into the field, and the artist will look in vain for better days, until this destructive error is corrected, and the public taste so cultivated that the majority will be able to discriminate between a clever likeness

and a hideous caricature. Daguerreotyping is an art, one that requires much study. The arrangement of the sitter for a daguerreotype likeness should be as carefully studied, and as artistically made, as though the image was to be chiselled in Italian marble, or painted on canvass.

But how many daguerreans are there in our country who have properly studied the arrangement of human beings for portraiture ? I fear the number is small. Why has not the great mass of operators, or the many, instead of the few, excelled in this particular ? for the very reason that they have neither taste nor genius ; and such will always hasten off a sitting with but little if any regard to attitude, while the true artist will glance at the sitter, carefully surveying the subject before him ; he will see every feature and form ; every faculty of his soul will be at work in selecting the best possible position ; his mind reverts back to past experience, it then darts with electric speed to the realms of ideality ; again he surveys the sitter and proceeds with his adjustments. But not so with the mere daub, or the man who regards daguerreotyping merely mechanical. Reader, watch the expressions of his coun-

tenance during his effort to sit a lady or gentleman for a likeness; he scarcely seems to realize what he is doing; he never had a sublime thought, nor a correct conception of art, consequently the sitter is left to do pretty much as he or she pleases. To such self-styled artists, (perverters of art,) I will take the liberty of addressing a few lines. You are treading upon holy ground—you are dabbling with the art of arts—you are ruining it; you are perverting public taste; your practice is as blighting as the simoon; your corrosive breath withers even the most lovely; you are a disgrace to the art, a nuisance in society, and an uncompromising enemy to improvement and refinement; you think you know everything, yet you know nothing; you are too selfish to profit by the experience of others, and too indolent to read, and the sooner you leave the business, the better for all concerned.

It is impossible for me in this brief article to place before the reader all, or even any one, of the attitudes which may be given; this can only be accomplished by a series of engravings or cuts, which we are not able to supply. I will therefore content myself to do as well as I can, with such illustrations as my feeble pen can furnish. All of the smaller sizes of daguerreotypes should be taken exclusive of the hands, or minature style, which enables you to get large and distinct features, and at the same time, there is no distended hands in the picture to frighten persons of delicate feelings by their enormous distorted appearance; besides this, all know full well that the hand (especially of a country gentleman) is no particular ornament to the picture, at least it is not so considered by either ancient or modern artists; hence it is that minatures are almost always of this character. In relation to the position of the body of the sitter, and the direction of the face, or the relation which it bears to the body, is a vast field for study. It is true that some few persons are of that peculiar structure, that an entire front view of body and face is best; but in as many as forty-nine cases out of every fifty, such would be a mere caricature. I will endeavor to describe a subject, such as should have an entire front position—for instance, a lady with a long neck

and round shoulders, (and as Dr. Wieting describes it) the stomach all caved in; add to this some peculiarities or deformities of the face—such as would be badly represented by a quartering view. In this case it is altogether advisable to give a front position. Likewise a gentleman of similar structure should be placed in a similar position. As a general thing, ladies and gentlemen, old and young, should have something like one of the following attitudes: If the face seems to require a front, or nearly a front view, place the body in a three-fourths direction; but if the face requires a quartering view, the body may be placed nearly front, but these are matters of taste too delicate in their nature to be mechanically taught and learned.—Mathematics and all of the sciences, are matters of fact with definite rules, which nearly all may learn to a greater or less extent; but not so attitude:—the artist must feel in his soul the importance and beauty of his calling, and to him alone should be entrusted the arrangements of his sitters. This talent, or aptitude for excelling is, I have said, what we receive from nature. Taste is not the only requisite gift of nature to excell in our art—a man must be a genius. Taste consists in the power of judging—genius in the power of executing. One may have a considerable degree of taste in poetry, eloquence, or any of the fine arts, who has little or hardly any genius for execution. It is not easy to describe, in words, the precise impression which is felt by the artist, when his mind is occupied with the study of attitude. We often interest ourselves in the study of machinery, the beautiful streets and blocks in cities; fields, and forests; it produces a sort of internal elevation and expansion; it raises the mind much above its ordinary state, and fills it with a degree of wonder.

If the common mind derives satisfaction from the contemplation of those objects, nature and art, how much more must the artist realize in them, and how much greater still must be his delight in the study of physical man, in an artistic point of view.

In conclusion, I will add, that the time is near at hand when the photographic picture will be adjudged of artistically as well

mechanically, and when this period arrives | faithfully this branch of the business, and
I hope all daguerreans will have studied | be fully prepared for the crisis.

LIVERPOOL PHOTOGRAPHIC SOCIETY.



THIS Society has been commenced with the view of promoting the art of photography and improving the process amongst its numerous practioners in Liverpool, held its second meeting at the Royal Institution, Colquitt street, on Tuesday evening, April 5th. Mr. Bell presided, and there was a numerous and encouraging attendance. Several new members were proposed.

The President said he should be glad to hear any facts from Members present, who would communicate the results of their experience, or anything which might be considered of interest to the meeting by Mr. Berry. The weather they were then enjoying was extremely favorable to the practice of photography, and he hoped before long the first portion of the evening would be devoted to considerable discussion and to interesting communications.

Mr. J. A Forrest, the Secretary, said there seemed to be an impression out of doors, that it was not at all likely that individuals, who might have spent some £40 or 50. in apparatus, and in practising the art, would be at all willing or likely to communicate the results of their experiments to the society, and consequently it was thought that it would be very little use joining the society. He begged distinctly to state that such was not the case; that, on the contrary, at their first meeting, communications were made by two practical working photographers in that room of the greatest possible value, and he was satisfied that those members he had met with were most anxious to communicate their experience to the society, and to promote the art in every possible way.

Mr. C. H. Chadburn believed that on the part of some of the professional photographers there was a disinclination to impart what they knew. One of the members applied to a very noted photographer, who would only communicate the mysteries of his art on condition that they were kept secret, and the consequence was that the gentleman did not take lessons.

The President considered that this was one of those arts which were capable of greater developement, and that all who made new discoveries in it were anxious to impart them, in order that they might attain the nearer to perfection.

Mr. Chadburn said there were some who made a positive living out of the secret.

Mr. Forrest.—Those must be very few.

The President.—And will be fewer still before many years are over. The president then stated that the selection of a room in which the members could meet and carry on their experiments had been under the consideration of the council, and that something definite would in all probability be decided by the next meeting.

Some beautiful specimens of collodion positives were exhibited by Mr. Mackinlay and Mr. Barker, and were much admired.

Mr. Berry, of Apothecaries' Hall, read a paper on "Collodion Negatives." He prepares the gun-cotton used in the manufacture of the collodion as follows:—Powdered nitre, 10 oz. ; sulphuric acid, 15 oz ; cotton wool, half ounce all by weight. The cotton is immersed three minutes, and then washed and dried in the usual manner. It should be silky in texture. He takes a mixture of bromide and iodide of silver, and by means of alcohol dissolves them with bromide and iodide of ammonium in slight excess. The solution thus obtained is added to a proper quantity of six

parts æther and one part alcohol, and a sufficient quantity of the prepared cotton is added, and after subsidence the collodion is ready for use. The silver bath is prepared as follows:—800 grains pure nitrate of silver are dissolved in 5 oz. of distilled water, and a small quantity of moist iodide of silver is added, which dissolves; then add 15 oz. more of distilled water; allow the precipitate to subside, and the solution is fit for use. When portraits are to be taken in dull weather, the impressions are generally too feeble to print well on paper, and views have not the requisite intensity in the high lights and sky to produce pleasing impressions. Mr. Berry, by the following means, can produce in any character of light, portraits of any degree of strength, and views with any amount of intensity that may be desired. Take a few grains of gallic acid, dissolve in spirit of wine, and add gradually and at intervals to the silver bath, stirring well at each addition. Make trials with an iodized plate between each addition, until the requisite strength of picture is produced. Allow the solution thus charged to stand until the next day, and it is fit for use, and will even in summer time continue to give strong impressions for two or three months, and may at all times be further strengthened by the addition of more gallic acid. The developing agent may be either pyrogallie acid or sulphate of iron, 10 grains to 1 oz. of water, with a small quantity of alcohol added. It is quite immaterial

which of the agents are used, the result being the same.

On the conclusion of the paper, an interesting discussion followed, on the subject brought forward by Mr. Berry, to whom the thanks of the society were rendered.

Mr. Barker was of the opinion, that if they had the French atmosphere, the English could produce much better pictures than France. The president considered the English atmosphere better for taking scenery than that of France or America: but several gentlemen dissented from that view, Mr. Berry stating that in practice he had found the Liverpool fog a great annoyance to him.

A question then arose as to the best time for taking pictures, Mr. Berry stating that in practice he preferred from 11 till 2 o'clock, and the president, that his experience was in favor of between 10 and 11.

Mr. Forrest stated that he had put a collodion positive into a glass-staining furnace, and that after subjecting it to the usual heat, he found the image stained yellow; and he was inclined to think it would be of advantage in printing, as it would not be liable to injury by rubbing off.

In concluding the business of the evening, the president congratulated the meeting on the numerous attendance, and expressed his belief, from the number of practical men who had joined, that the society would not only prove beneficial to themselves, but to the community at large.

CLEANLINESS in the daguerreotype process is as necessary to good results, as taste, skill, and care.

Extract from a Manuscript Volume, soon to be Published.

THE FINE ARTS.



R. EDITOR:—I have before felt bound to speak strongly in your Journal of the low and inadequate views entertained by numerous daguerreotypists, as well as by the public, touching the true position, claims, and possibilities of Heliography. I said it had too widely been esteemed a mere *mechanical* process, requiring neither genius, artistic taste, nor general culture, but which any and every one might learn to exercise by a few weeks' attention.

But I rejoice now to see, that better days are dawning. One sign of this is the recent institution in England of a Photographic Society, composed of men of the highest standing as to genius, science and various culture, for the express purpose of improving this art by study and experiment. In the very first of the four Nos. I have received, I notice an address by Sir Wm. J. Newton, a Vice President, wherein he justifies all I have said concerning the claims of heliography to be a fine art, and urges on its practitioners the same general culture and careful experimentation, which are held essential to all other artists, who would achieve eminence.

I have, therefore, thought that some remarks on the fine arts in general, their basis in nature, and their uses, might be especially appropriate to a journal devoted to the interests of heliography.

That in the utilities of life and material prosperity our country stands high, and perhaps even highest, in the scale of nations, there can be no doubt whatever. As little doubt can there be that in artistic culture many a cotemporary people are our superior.

This, however, may be admitted without shame. Pioneers and tamers of a primitive world, as we have been hitherto, we have had neither leisure nor means for much cultivating the mere embellishments of life. But with our present material attainments, it is quite time that the energy

and inventive ability, which have accomplished so much here, should be turned towards the fine arts. And as vague, erroneous notions prevail as to the real nature of these arts, it may be well to state some reasons for their cultivation.

And, first, I would remark that, irrespective of all special uses of the arts, their cultivation may be urged on the simple ground that they answer to one of our natural wants, being the preordained development of that law of beauty and harmony, whose germs are implanted in every soul. Thus in even the most savage tribes yet discovered, some rude essays at embellishment are found. Not one of them is content with what are termed the indispensables of life; but among their most prized possessions are feathers and a thousand various trinkets, which they regard as making attractive themselves and their belongings.

It is similar with children, whether in the savage or civilized state. Trinkets and toys, and all things bright and showy, however rude, are among their earliest tastes. And I suspect that the fondness for tales in all kinds, common to both child and savage, is another manifestation of the same radical principle.

Such being the fact, we can press the cultivation of the fine arts on the ground that such is the will of God. Since most of his gifts are bestowed in the germ, the mere fact of His conferring certain *capacities* should be evidence enough of our obligation to labor for their development. But artistic culture has many specific uses.

Thus the arts open to their amateurs inexhaustible sources of enjoyment. It were superfluous arguing that men must needs have relaxation and amusement. Labor, the common lot, has not yet been made in itself pleasurable and attractive; generally wearisome, often positively repulsive, it would be insupportable but for seasons of relaxation.

If, then, mankind must and will have pleasure, what shall this be? Few questions are more momentous. For where

there is no mental culture, sensuality is the main resource, and fatal excess its too frequent accompaniment. And even where excess is avoided, sensual indulgence, unchastened by the activity of the higher powers, is of debasing tendency.

But let the love of manifold beauty be developed, and how vast man's resources for enjoyment! Painting, sculpture and architecture, music, poetry, and universal letters offer springs of pleasurable emotion, which, while ever new and fresh, are absolutely fathomless. Pure delights they are too, harming neither him who tastes nor those connected with him.

And still better, these enjoyments are morally and spiritually elevating in tendency. Not that in point of fact all artists and amateurs reproduce in their sentiments and life, the harmony and beauty of art. But this is not the fault of art itself. It does but show that the artistic element is not in them strong enough to hold in check other passions of a debasing kind and accomplish its own specific ends. In other phrase, though a veritable angel of blessing, it is not omnipotent.

How, indeed, can it do else than purify and exalt, since it brings the mind into sympathy with one of the most conspicuous of the Divine attributes?

For if wise design and benignant use be everywhere visible in creation, not less universal and perceptible are the forms and hues of beauty. How prodigally, indeed, is that beauty poured out over earth and sky! And not alone either where man may take cognizance of it. In the very heart of sylvan wilds, where human foot never trod, countless flower-tribes, lovely and fragrant enough for a seraph's wreath, bloom and perish, it might seem, in vain. Why, too, was the interior of the muscle's shell painted with the rainbow's matchless hues, only to lie on the dark bed of Ocean, "a thousand fathoms down"? What numeration could reckon the kindred instances where, on birds, fishes, and insects, are lavished beauties of shape and tint beyond the reach of man's art, and yet with no discernible end to be subserved thereby?

Is it, then, presumption to suppose that such beauty exists because its author delights in its creation? Why may we not believe, that all this grace and loveliness are not

"born to blush unseen,
And waste their sweetness on the desert air,"

but that their creator enjoys the contemplation of these exquisite works of his hands!

The artist, therefore, who by pencil or chisel, by pen or voice, brings before us shapes of beauty or grandeur; what does he but cooperate with the great protoartist, and in his humble measure participate in his work of creation? And he, who though culture has become susceptible to the charms of multiform art, must, through the same susceptibility, love and enjoy also the divine manifestations of grandeur and loveliness. And the artist and amateur, who dwell thus delightedly on the derivative beauty incarnate in effects, are more likely than others to venerate and love the great Original cause of beauty—the Being, who is himself the absolute, essential Beauty and Wisdom, Life and Love!

We plead, then, for the cultivation of art both as a means of recreation and refreshment to a toiling race and not less for its genial and elevating influence on the character.

If needful, I might recommend artistic culture on the ground of utility alone; since precisely the same mathematical principles lie at the basis of both the fine and useful arts. Design, proportion, adaptation, are common to both; and speaking generally, the animal or machine or implement, which comes nighest the ideal of its own type of beauty, is for this precise reason the strongest and best fitted, every way, for its special uses. The mind artistically trained occupies, therefore, a sphere, wherein useful discoveries and inventions, not less than those of mere beauty, are likely to be suggested to it,—*more* likely I think, than to the exclusive student of the useful arts, in consequence of the superior delicacy of perception, which is the natural fruit of such culture.

It is universally admitted, that the fine arts communicate to the mind that refinement and to the life those accomplishments and graces, without which the one is incomplete and rude and the other bald and bare. Of course men must first provide life's absolute essentials; nor will I object to their procuring, as a second step, its material conveniences and comforts. But I insist, that the very next stage, in a

true development, is to secure that intellectual culture, of which the fine arts constitute a large share—embracing, perhaps, all not covered by the term science. Without this, we must be little higher or other than animals.

But through the portals of art we enter a vastly higher and nobler than the animal sphere: one in which the Divinity is our prototype and exemplar, and unseen angels are sympathising and helpful associates. It is the domain of the beautiful; boundless, exhaustless and infinitely various, like its author and supervisor. Thenceforward man, both the individual and social has before him an illimitable work, fully worthy his most strenuous endeavors. This work is to shape and array his total life into harmony with the laws of beauty. Such work demands, that commencing with what is most individual, we conform our feelings and thoughts, our speech and port, our movements and costume to the standard prescribed by those laws; that, still further, we fashion, according to this standard, our domestic and public structures with their furniture and equipments; our implements to whatever use applied; and finally whatever we touch and hear and look upon at home and abroad, so far as within our control. Life's ideal requires, that every human being, whether in his hours of labor or recreative leisure, should be encompassed by sights and sounds incarnating the most advanced existing conceptions of loveliness, grandeur and nobleness,

that so his nature's best elements may be kept alive and active, while enjoying the conditions of further expansion and growth.

To some extent this idea was actually embodied in life by the ancient Greeks and Romans. They made beauty and magnificence almost

"As broad, as general, as the casing air," in many spheres, which in these modern days exhibit little save ugliness and meanness.

We cannot, however, doubt that we are destined to higher achievements even than theirs. It will assuredly be so, if that American energy so prolific of prodigies in the domain of utility, shall fling its total self into the culture of art. And would we rid ourselves of that servile propensity to imitation, implanted in us by our constant intercourse with old Europe, and act fully out the originality springing from our novel conditions, in this respect, as we have done in so many others, I doubt not, that a new and magnificent type of universal art would be ushered into the world. The copyist—as the American has too generally been—can never equal his model, since he works not with the freshness and surging enthusiasm of a primal impulse. To be alike true and great, American art must be America's spirit and life, with all their individualities, idealised and encircled with the magic halo of beauty!

M. A. Root.

Phila. June, 7, 1853.

140 Chesnut street.

— We would call the attention of our readers to the fact that the celebrated California views of Mr. Vance, are to be sold at auction on the 20th of July, 7½ P. M., at the auction rooms of Bangs, Brothers & Co. No. 18 Park Row, New York. All these views are fine—many of them exquisitely

beautiful, and highly deserving the serious attention of our first class artists.

— The World's Fair opens on the 15th of July, without fail. The large space allotted to daguerrean artists convinces us that the finest display ever made of photographic pictures will grace it.

From the Journal of the Photographic Society.

PHOTOGRAPHIC ENGRAVING.

BY H. FOX TALBOT, ESQ.



now proceed to give you an account of my newly-invented method of making photographic engravings upon steel. Of course, I have no need to observe that the art is at present in its infancy, but I have great hopes that it will very soon be considerably improved in all its details.

The first thing to be done is to select a good steel plate, and to immerse it for a minute or two in a vessel containing vinegar mixed with a little sulphuric acid. The object of this is to diminish the too great polish of the surface, for otherwise the photographic preparation would not adhere well to the surface of the steel, but would peel off. The plate is then to be well washed and dried. Then, take some isinglass and dissolve it in hot water. The solution should be strong enough to coagulate when cold into a firm jelly. This solution of isinglass or gelatine should be strained, while hot, through a linen cloth to purify it. To this must be added about half as much of a saturated solution of bichromate of potash in water, and they should be well stirred together. When cold, this mixture coagulates into a jelly, which has very much the appearance of orange jelly. The method of using it is to liquify it by gentle heat, and to pour a quantity upon the center of the steel plate. Then take a glass rod, hold it horizontally, and spread the liquid uniformly over the plate. Then incline the plate, and pour off the superfluous gelatine. Let the steel plate be placed upon a stand, and kept quite horizontal, that the liquid may not run to one side of the plate. Then place a spirit lamp beneath the plate, and warm it gently till the gelatine is quite dried up. When dry the film of gelatine ought to be bright yellow and very uniform. If clouded bands appear upon the surface, it is a sign that

there is too little gelatine in proportion to the bichromate, which must therefore be corrected. The steel plate now coated with gelatine, is ready to receive a photographic image of any object. First, let us suppose the object is one capable of being applied closely to the surface of the plate; for instance, let it be a piece of black lace or the leaf of a plant. Place the object upon the plate in a photographic copying-frame, and screw them into close contact. Place this frame, in the direct light of the sun for a short time, varying from half a minute to five minutes. Let it then be removed and the plate taken out and it will be found impressed with a yellow image of the object upon a ground of a brown color, as might be expected from the well-known photographic property of the bichromate. The plate is then to be placed in a vessel of cold water for a minute or two, which dissolves out all the bichromate and most of the gelatine also from the photographic image, *i. e.* from those parts of the plate which have not been exposed to the sun, being protected by the object; while, on the contrary, it dissolves little or none of the gelatine film which has been fully exposed to the sun's rays. The consequence of which is, that instead of a yellow image we have now a white one, but still upon a ground of brown. The plate is then removed from the water into a vessel of alcohol for a minute, and is then taken out and placed upright on its edge in a warm place, where in the course of a few minutes it becomes entirely dried. This terminates the photographic part of the operation. If the plate is carefully examined while in this state, it appears coated with gelatine of a yellowish brown color, and impressed with a white photographic image, which is often eminently beautiful, owing to the circumstance of its being raised above the level of the plate by the action of the water. Thus, for instance, the image of a piece of black lace looks a real piece of very delicate white

lace of similar pattern, closely adhering to, but plainly raised above, the brown and polished surface of the plate, which serves to display it very beautifully. At other times the white image of an object offers a varying display of light when examined by the light of a single candle, which indicates a peculiar molecular arrangement in the particles of gelatine. These photographic images are often so beautiful that the operator feels almost reluctant to destroy them by continuing the process for engraving the plate.

In order to explain how such an engraving is possible, it is, in the first place, to be observed that the photographic image differs from the rest of the plate, not only in color, but, what is of much more importance, in the thickness of the film of gelatine which covers it. The coating of gelatine on the rest of the plate is, comparatively speaking, a thick one, but that which originally covered the image has been most removed by the action of the water, a small portion, however, almost always remaining. It therefore naturally happens that when an etching liquid is poured on to the plate, it first penetrates through the thin gelatine covering the image, and etches the steel plate beneath. But the next moment it penetrates likewise through the thicker coating of gelatine, and thus spoils the result by etching the whole of the plate. Nitric acid, for instance, does this, and therefore cannot be employed for the purpose. Since the other chemical liquids which are capable of etching steel have a certain analogy to nitric acid in their corrosive properties, they also for the most part are found to fail in the same manner.

This was a difficulty. But after some researches I found a liquid which etches steel perfectly well, and at the same time is free from the inconvenient property of penetrating the gelatine film. This liquid is the bichloride of platinum. In order, however to use it successfully, it must be mixed with a certain quantity of water, neither more or less (I mean, to any material extent), otherwise its action becomes irregular. The best way is to make a perfectly saturated solution, and then to add to it one-fourth of its bulk of water. Then correcting this by a few trials, a solution of proper strength is finally obtained. Supposing, then, that we have prepared

such a solution, the operation of etching the plate is performed as follows:—The plate is laid on a table, and a small quantity of the bichloride being poured upon it, it is to be rapidly diffused and spread over the whole plate with a camel-hair brush. Not much liquid is poured on, because its opacity would prevent the operator from distinguishing the effect produced by it on the metal. For this reason, it is hardly necessary to make a wall of wax round the plate; that is, if the portions to be etched are confined to the central part of the plate, and do not approach very near to the edge. The effect of the liquid upon the plate is not at first visible, since it disengages no gas; but after the lapse of a minute or two the white photographic image begins to darken, and soon becomes black in every part. When this change is complete, the image often looks very beautiful, though quite altered from what it was before. The operator should carefully watch the image until he thinks that it is finished, or not likely to be further improved or developed by continuing the process any longer. He then inclines the plate gently, and pours off the liquid by one corner of the plate. The plate is then dried with blotting-paper, and then a stream of salt water, which is better than fresh water for this purpose, is poured over the plate, which removes all traces of the etching liquid. The plate is then rubbed with a wet sponge or linen cloth, which in a short time detaches and removes the film of gelatine, and discloses the etching that has been effected. When the object is not of a nature to be applied directly to the surface of the plate, the most obvious method of proceeding is, of course, to place the prepared plate in the focus of a camera, and to direct the camera to the object. But in consequence of the low degree of sensitiveness of bichromate of potash, this would take, generally speaking, too long a time to accomplish. The better way in practice, therefore, is to take a negative photograph of the object on paper with a camera, and from this to obtain a positive copy either on glass or paper, which should be very uniform in texture, and moderately transparent. Then this positive copy is placed on the plate in a photographic copying frame, and being placed for a few minutes in the sun, it impresses the plate

with a photographic image ; which image, etched as above described, and printed off upon paper, will finally give a positive representation of the object. If the object depicted upon the plate by the sun's rays is broad and uniform, for instance, the opaque leaf of a plant, then, of course, the etching is uniform also. When this is printed off, it produces an effect which is not always satisfactory. I will therefore now explain a modification of the process which destroys this uniformity, and which in many cases produces a great improvement in the general effect.

For this purpose I must remark, in the first place, that if a piece of black gauze or crape is the object selected for representation, it produces an engraving of itself which is marvellously accurate. But when two folds of the gauze are laid across each other obliquely, then the resulting engraving requires a lens in order to separate from each other and distinguish clearly the lines belonging to the two portions of the gauze. Now, if this engraving is printed off, the result offers to an eye at a moderate distance the appearance of an uniform shading. Now, I avail myself of this circumstance to modify my original process as follows :—suppose the object to be the opaque leaf of a plant, of irregular outline, first, I cover the prepared plate with two oblique folds of black crape or gauze, and place it in the sunshine for two or three minutes. The effect of this is to cover the plate with a complicated image of lines passing in all directions. Then the leaf is substituted for the crape, and the plate is replaced in the sunshine for two or three minutes more. The leaf being then removed from the plate, it will be seen that the sun has obliterated all the lines that were visible on the parts of the plate exterior to the leaf, converting all those parts to a uniform brown. But the image of the leaf itself is covered with a network of innumerable lines. Now, let this be etched in the way already described, and let the resulting etching be printed off. The result is an engraving of the leaf, which when beheld by the eye at a certain distance appears uniformly shaded, but when examined closely is found to be cov-

ered with lines very much resembling those produced by an engraver's tool, so much so that even a practical engraver would probably be deceived by the appearance. This crape arrangement I call a *photographic veil* ; and as I think it likely that the idea will prove useful, I will make a few more remarks upon it. It is clear that an arrangement composed of two thicknesses of ordinary crape or gauze is but a rude attempt at a photographic veil. To realize the practical utility that may result from the idea, supposing it to be borne out by further experience, it would be proper to fabricate a much finer material, and to employ five or six thicknesses of it, or else to cover a sheet of glass in any convenient manner with an innumerable quantity of fine lines, or else with dots and specks, which must be opaque and distinct from each other. The result of practically employing such a method, supposing always that it answers in practice, as I think it probably will, would be an etching apparently uniform, but really consisting of separate small portions, in consequence of which it would hold the ink much better, and other obvious advantages would also be obtained. Another mode of accomplishing the same object is to cover the plate originally with an aquatint ground. But then a fresh one would be required for every plate, whereas a single *veil* would serve for any number of plates in succession. Experience alone can decide between these different methods. When the etching is finished, the plate should be very soon coated with wax to protect it. A few hour's exposure to the atmospheric air rusts and destroys the etchings when newly made, although it does not do so afterwards. The oxidation only attacks the lines of the etching, the rest of the plate sustaining no injury, if the air is tolerably dry.

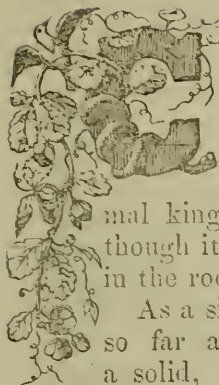
Having thus described the method of producing the photographic etchings, it would, I think, extend this letter to too great a length were I to add any remarks upon the theory of the process, which will better be deferred to another opportunity.

H. F. TALBOT.

Lacock Abbey, April 25.

CHEMISTRY. No. VI.

BY GURDON EVANS, A. M.



CARBON—Symbol C. Combining No. 6.

Carbon is the great combustible in nature. It plays a more conspicuous part in the vegetable and animal kingdoms than in the mineral, though it is not a very rare element in the rocky mass of the earth.

As a simple substance or element, so far as known, carbon exists as a solid, well known in the form of charcoal, and more rarely in the diamond, both of which are pure carbon. Plumbago, or black lead, the graphite of the mineralogist, is over ninety per cent. carbon, mixed usually with iron and a few other substances. Vast stores of a highly carbonated substance are deposited in the bosom of the earth in the form of mineral coal, embracing all the varieties of bituminous, anthracite, cannel coal, &c. These beds, like charcoal, doubtless had a vegetable origin.

A remarkable quality of carbon is its exceeding *hardness*. In the diamond it is capable of cutting glass, and most other crystalline and vitreous substances. Charcoal, though easily crumbled to fine powder, is in this state nearly as sharp as diamond dust, and of great value as a scouring powder, readily grinding glass and the metals, leaving a fine surface for polishing. Plumbago, a form capable of still finer divisions, is, in an impalpable powder, exceedingly sharp and fine, and by many *daguerreans* used and highly prized on the finishing buff.

The great practical use of carbonaceous substances is for fuel in the form of coal or wood, and as building materials in timber and lumber of all descriptions.

Compounds of Carbon and Oxygen.—Two of these only are known.

Carbonic Oxyd, C. O., equivalent, 14.

Carbonic Acid, C. O₂, equivalent, 22.

The first is prepared by passing carbonic acid through a tube containing red hot charcoal, when the acid takes another pro-

portion of carbon. It is very little known, either in nature or the arts, and of little interest except to the purely scientific. It is a colorless gas, and burns with a fine bluish flame. When first discovered it received the name of *phosgene*.

Carbonic Acid, C. O₂, is abundant, and of the utmost utility in almost every department of nature and art. Alone it is a gas, colorless, of a slight acid taste and so heavy that it may be poured from one vessel to another, like water, having a specific gravity of 1.524. It does not support life or combustion; it is supposed, indeed, to be an active poison when inhaled, though it may be quite largely mixed with air without producing any immediate bad effects.

Preparation.—Carbonic acid is best prepared for experiment from pulverized chalk, which is the carbonate of lime. The carbonic acid is liberated by exposing the chalk to the action of some stronger acid—muriatic being most convenient. In this case, the affinity of the lime is stronger for the muriatic than for the carbonic acid; hence the latter is liberated, and being a gas escapes in an effervescence through the liquid. This gas constitutes about one part in two thousand five hundred of the atmosphere by measure, or about seven tons over each square acre.

It is being constantly taken from the air by growing plants, aiding to build up their structure, and when the vegetable is again disorganized by decay, digestion or combustion, the carbonic acid it contained is again restored to the atmosphere—processes by which the requisite amount of that gas is kept good in the air.

In ordinary respiration the air thrown from the lungs contains from four to eight per cent. of carbonic acid, whereas before it contained one part only in twenty-five hundred; showing an increase of as much as one hundred times the amount in common air. This is the result of the decomposition of the food digested in the animal stomach.

Carbonic acid is also produced in certain localities, and issues from the crevices of rocks or earth in large quantities. It is also found in the bottoms of wells, and in such cases it is not safe to descend into them until it is removed, as it may be by lowering a vessel of burning coals.

It is the constant product of combustion. If an open furnace of charcoal be burned in a small, close room, the air soon becomes so charged with this invisible poison that one is not able to breath it without danger of suffocation.

This gas may be reduced to a liquid, or even a solid, by great pressure and intense cold. Its expansive force is also found to be very considerable, and experiments have been undertaken to use it as a motive power instead of steam, thus far, however, without any very favorable results.

Whether it be produced by combustion, respiration or decay, it is always formed from the carbon in the decomposing substance uniting with the oxygen of the atmosphere in the proportion of six parts of carbon by weight to sixteen of oxygen.

Carbon and Hydrogen combined, form two compounds, one of which has, during the last half century, assumed great importance. I refer to illuminating gas.

Heavy carbureted hydrogen, Symbol CH, combining No. 7.

Light carbureted hydrogen, Symbol CH₂, combining No. 8.

Heavy Carbureted Hydrogen.—*Olefi-ant gas* is the true illuminating gas, and is composed of six parts, by weight, of carbon, and one of hydrogen. When the gas for illumination is prepared from coal, resin, or oil, as it usually is, it contains a mixture of other gases, as the light carbureted hydrogen and some others; all, however, are less luminous than the heavy carbureted, and only depreciate the value of the gas for illuminating purposes. This gas is prepared pure by heating in a retort a mixture of alcohol and strong sulphuric acid. Its specific gravity is 81.57 grains.

Light Carbureted Hydrogen, known as Marsh Gas, is abundantly produced in marshes and wet places, when vegetable and animal matter is decomposing under water. In this case the hydrogen of the water and the carbon of the vegetable or animal unite in the proportions of six of carbon and two of hydrogen. It burns with a flame less brilliant than Olefi-ant gas. Both are highly explosive when burned with oxygen.—*Scientific Daguerrean.*

From the Jour. of the Photographic Society.

PHOTOGRAPHIC APPLICATIONS AND SUGGESTIONS.

"A method of obtaining Positive and Direct Photographic Impressions upon Plates, of any kind, and principally those used in Engraving," by M. A. MARTIN.



M. MARTIN, well-known for his successful pursuit of the art of photography, has just communicated to the Paris Academy of Science the particulars of a method of applying the collodion process to the production of impressions, replacing the tracings or drawings upon wood or metal, which now form the basis of the engraver's operations. It seems surprising that this application of

the art has not already been useful, especially in regard to woodcuts, since there do not appear to be any great practical difficulties in the way. The process of M. Martin has the advantage of being *direct*, but it appears likely that it would be generally more convenient to take the negatives on glass, and to print positives from them upon the woodblocks or metal plates, since, the former of these, especially, would be awkward objects to arrange in the camera. We derive the following particulars from '*La Lumiere*' of April 18th, 1853.

"At the Sitting of July last, I had the honor to communicate to the Academy a photographic process for obtaining positive and direct impressions on collodion in a certain and rapid manner. I thought at

that time, if such impressions could be formed on the surface of the wood, copper and steel used for engraving, the work of the artist would be considerably simplified. I made some experiments then, which the unfavorable season compelled me to interrupt. Having since taken them up again, I have the honor to lay the results before the Academy.

"The method I employ is the same as that I have given for impressions on glass. The metallic plate, covered in the usual way (but on both sides) with the varnish used in etching with *aqua fortis*, is coated with collodion, iodized, plunged in a bath of nitrate of silver, &c. The impression, from which the iodide unaffected by the light is removed by the cyanide of silver bath, is washed in abundance of water, dipped in a solution of dextrine, and dried. The impression then serves the engraver exactly for the same purpose as the tracing which is ordinarily made upon the etching ground or varnish. A second impression taken on glass, preserves, as a copy, the design which the engraver destroys on the plate as he proceeds with his work.

"By covering metallic plates of any kind, or sheets of card-board, with varnish, and operating in the same way, we obtain impressions which conjoin with the qualities of positive impressions on glass, a solidity and facility, of transport which the latter do not possess.

M. Martin sent with the communication a photographic tracing upon wood and a proof of a steel engraving, for which the image had been produced directly upon the metal plate.

On the use of Talc for Collodion Negatives.

TO THE EDITOR OF THE PHOTOGRAPHIC JOURNAL. SIR: One of the greatest objections to the collodion process in photography appears to be the weight and brittleness of the glass plates employed, which qualities render it less eligible to travelers than paper.

It has occurred to me that these objections are obviated by the use of *talc*, which may easily be obtained in large and perfect sheets. It is flexible and light, and the solutions employed have no perceptible action upon it; upon obtaining a picture, a thin film of the *talc* may be split off with the

collodion upon it, and the surface from which it is split requires *no cleaning*, but is at once ready for a second film of collodion.

By having a sufficiently thick plate of *talc* several such films with pictures might be successfully removed from it; these films might be placed in a book of leaves of pasteboard with the centres cut out, which would protect them from contact with each other. I may add that I have produced pictures in this way, and have no doubt that traveling photographers will find my suggestion of service.

I am, Sir,

Your obedient servant,

NORRIS F. DAVEY.

Romford, May 2, 1853.

Rules for taking Stereoscopic Views of Landscapes.

If the nearest object be distant fifty feet, arrange the two cameras perfectly horizontally, and parallel to each other, placing them two feet apart, measured from the centre of each lens.

Let the distance between them (measured in this way) be always directly proportionate to the distance of the nearest object, which must be determined by the tape; thus when the object is twice the above distance off (100 feet) place the cameras 4 feet apart; for 150 feet, 6 feet apart, and so on.

For trees it does not seem very important that perfect horizontality of the cameras should be preserved. If they are arranged horizontally it is only possible, in very peculiar situations, to avoid making the foreground disagreeably and disproportionately large.

Mr. Fenton does not keep the cameras parallel in taking landscapes; but observing Prof. Wheatstone's rule, as above, respecting distances, inclines them so that the same object may occupy as nearly as possible the centre of each ground-glass plate.

Extraordinary relief of distant objects may be obtained by arranging the cameras with special reference to them. Thus views taken across the Thames, by placing the cameras 12 feet apart, produce an astonishing effect. In such views, of course, no near objects must be admitted.

Horizontal position of the cameras is absolutely necessary when buildings are

taken; otherwise, when viewed in the stereoscope *placed horizontally*, they appear to be falling over.

A new Preparation of Iron for developing Collodion Pictures on Glass. By the Rev. J. LAWSON Sisson.

Protosulphate of iron..... 12 grains.
Nitrate of lead..... 8 "
Water (not distilled)..... 10 drms.
Acetic acid..... $\frac{1}{2}$ "

Dissolve the protosulphate of iron in the water, then throw in the nitrate of lead in powder; stir with glass rod until dissolved; pour in the acetic acid, stirring it at the same time and for a few minutes afterwards. Let the precipitate subside, then filter.

It will keep good any length of time. It requires no mixture of pyrogallie acid or nitrate of silver with it; it is colorless as water when first prepared. After a few days it changes color, but does not lose its developing properties.

[This developing solution approaches closely to that of Dr. Diamond, wherein the nitrate of baryta is used instead of the nitrate of lead to decompose the protosulphate of iron. In both cases the important product is protonitrate of iron. Possibly the acetic acid may have some influence in improving the keeping qualities of this solution. The discoloration would appear to arise from a pro-oxidation of the iron; but probably this is only partial, since the per-

nitrate of iron is stated by Mr Hunt to be useless as a developing agent.—Ed.]

2nd May, 1853.

SIR.—I shall feel extremely obliged by your kindly answering the following questions:—

1. What is the best varnish for coating collodion negatives, and how should it be made?

2. What is the best foil for placing at the back of a collodion positive?

With regard to the latter query, I have tried black paper, as also velvet; the former, however, gives the picture a slaty appearance, whilst the latter has objections on account of the minute specks or films of white which adhere to the velvet, and which no brushing will remove.

I am, Sir,

Your most obedient Servant,
H. F.

[1. The varnish which has been most approved of is that composed of gum dammar dissolved in chloroform, made moderately thin. Gum dammar is a kind of resin obtained from the *Dammara orientali*, and is now largely used in varnishes as a substitute for mastic.

2. Some of the black varnishes used for painting iron-work, and similar purposes, known as "patent black," &c., may be tried; we believe they have been employed with advantage.—Ed.]

CHLORO-BROMIDE OF LIME.—As its name indicates this is a combination of chlorine, bromine and lime. M. Baron Gross gives the following method of preparing it. First saturate slacked lime with bromine vapor, and when the lime (which it is best to employ rather damp) has attained a good orange color, the mixture is put into a wide-mouthed bottle, connected with a retort, containing chloride of bromine. Under the action of this latter vapor the mixture becomes of a pale yellow color, resembling sulphur. The

pound is then stirred with a glass rod, and on removing the upper crust (the aristocratic portion we suppose, according to the present definition of the word,) the interior will be seen to be of a blood red color. The absorption of the vapor is continued until the whole mass becomes of a uniform color, and vapors of a reddish tint are perceived in the bottle. It must be left to repose for a day or two, well closed, and will then be fit for use. The proper coating for this compound is not given, and must be discovered by experience.

LIFE OF HENRY FUSELI.*

BY A. CUNNINGHAM.



his reverence for Homer and regard for Cowper induced him, on the appearance of the *Iliad* in 1793, to write a criticism upon it in the *Analytical Review*, a work which was favored with many contributions from his pen—on natural history, classical learning, and the fine arts. It was not easy indeed to translate up to Fuseli's notion of Homer; and Cowper comprehended him fully when he read his critique. "I am happy," said that modest and devout poet, "to have fallen into the hands of a critic rigorous enough indeed, but a scholar and a man of sense, and who does not deliberately intend me mischief. I am better pleased indeed that he censures some things, than I should have been to be treated with unmixed commendation; for his censure, to use the new diplomatic term, will accredit his praise. In his particular remarks he is for the most part right, and I shall be the better for them, but in his general ones I think he asserts too largely and more than he could prove." The observations in this criticism were sometimes profound, often sagacious, and occasionally sarcastic.

It pleased Fuseli to be thought one of those erudite gentlemen whom the poet describes—

Far seen in Greek—deep men of letters,
and he loved to annoy certain of his companions with the display of his antique lore. He sometimes composed Greek verses in the emergency of the moment, and affected to forget the name of the author. He once repeated half a-dozen sonorous and well-sounding lines to Porson, and said, "With all your learning now you cannot tell me who wrote that." The professor, "much renowned for Greek," confessed his ignorance, and said "I don't know him." "How the devil could you know him?" chuckled Fuseli—"I made them this moment." When thwarted in the Academy,

and that was not seldom, his wrath aired itself in a polyglott. "It is a pleasant thing and an advantageous," said the painter, on one of these occasions, "to be learned. I can speak Greek, Latin, French, English, German, Danish, Dutch, Icelandic and Spanish, and so let my folly or my fury get vent through nine different avenues."

Many sarcastic remarks were uttered and more written on the wild insobriety of his productions, and as he was not spared himself, neither did he spare others. His vanity was galled, not wounded, by the random strictures of criticism; and his reign at the table of Johnson, the bookseller, where he appeared weekly, was sometimes rendered uneasy by the satire of Wolcot, to whom the oddities of the artist presented a broad mark. He had reigned there forty years, adorning the society by his learning, and enlivening it by his wit, and in both he was a match for any of the distinguished men, and those were not few, whom it was his fortune to encounter.

When Barry lost the professorship of painting, in the year 1799, it was bestowed with acclamation upon Fuseli, and as his mind was overflowing with knowledge of all kinds, he found little difficulty and much pleasure in fulfilling the duties of his new station. During his professorship he delivered nine lectures, of which the following six only are printed—on ancient art, modern art, invention, composition, expression, and *chiaro-scuro*. The first three are the best. In them he has poured out learning, observation, and feeling with a lavish hand, and there is an original power in his diction, such as no man has exhibited before or since in a language not his own. The first three lectures were delivered in 1801: the crowds who went to hear them were great, and their cheers vehement. His disquisition upon invention has been deservedly admired. It is difficult to select a single passage which will give a sufficient notion of the author's original grasp of mind.

"Form, in its widest meaning, the visi-

* Continued from page 376, Vol. 5, No. 6.
VOL. VI, NO. I.

ble universe that envelopes our senses, and its counterpart, the invisible one that agitates our mind with visions bred on sense by fancy, are the element and realm of invention, it discovers, selects, combines the possible, the probable, the known, in a mode that strikes with an air of truth and novelty. Possible, strictly, means an effect derived from a cause; a body composed of materials, a coalition of forms whose union or cogeny imply in themselves no absurdity, no contradiction; applied to our art, it takes a wider latitude; it means the representation of effects derived from causes, or forms compounded from materials heterogeneous and incompatible among themselves, but rendered so plausible to our senses that the transition of one part to another seems to be accounted for by an air of organization, and the eye glides imperceptibly on with satisfaction, from one to the other, or over the whole. That this was the condition on which, and the limits

within which, the ancients permitted invention to represent what was, strictly speaking impossible, we may with plausibility surmise from the picture of Zeuxis, described by Lucian in the memoir to which he has prefixed that painter's name, who was probably one of the first adventurers in this species of imagery. Zeuxis had painted a family of Centaurs: the dam, a beautiful female to the middle, with the lower parts gradually sliding into the most exquisite forms of a young Thessalian mare, half-reclined in playful repose, and gently pawing the velvet ground, offered her human nipple to one infant centaur, while another greedily sucked the feline udder below, but both with their eyes turned up to a lion whelp held over them by the male centaur, their father, rising above the hillock on which the female reclined, a grim feature, but whose ferocity was somewhat tempered by a smile.

TO BE CONTINUED.

Gossip.



It is the generally received opinion of all classes, both in this country and Europe, that the photographic art has many discoveries yet to make, before it arrives at that perfection so ardently wished for. Now, in this country at least, a marked improvement must be made in the manipulators of the art as a class, before we can hope to arrive at any great degree of perfection. We intend to speak plainly at all times, and on all occasions, of the abuses in the art, as well as its abusers—not from any personal motives

towards them, but from a sense of the necessity which exists for purging the art of those who disgrace it, before the accomplishment of any great improvement in its character.

It answers a very good purpose, for the journalist himself; to tickle the fancies and self-esteem of any class of men, but it is neither manly on his part, nor honest; neither is it just to the public. We have always endeavored to shape our course in this respect so as not to give offence to the moderately successful but deserving, or excite the jealousy of prominent artists. For the mere dabsters—the clodpoles—we have no sympathy—desirous of ridding the art of them we care neither for their anger or their abuse. Our duty is to assist to improve the art, and those who are, either,

unwilling to be improved or incapable of improvement must be made to feel that they cannot subsist upon it.

There are three classes of photographic artists in this country.

Those who deservedly stand pre-eminent in the art ;

Those who are not so successful in its practical details, but who aim at a higher standard ;

And those who have taken it up merely for the sake of a precarious and easy livelihood, caring little about the quality of the work done, and filling up the necessary deficit in their cash account by making dupes of equally miserable aspirants to the art, whom they rob under the false pretence commonly denominated among them, "*learning a pupil*."

It is with this latter class we now intend to deal. We have said but little in regard to them recently as they appeared to be dying out, but a new impulse having been given to the business within the last few weeks we find them renewing their activity and making one last sad effort to regain their ascendancy.

These men are generally known by their constant advertisement for new dupes—their invariable practice, of abusing all others more worthy of the cloth than themselves, and a certain unlawful method of obtaining their stock in trade by purchasing of thieves, cheats, and swindlers. Every low and degrading practice is resorted to in order to increase the size of their purse, left vacant in consequence of the entire want of talent for picture making. It is astonishing to us that so many who are really worthy and talented artists can associate in any manner with this class. That it is possible to entirely rid the art of these men we cannot believe, but their increase may be prevented by refusing to instruct. We had intended to lash these men thoroughly, but the brief description

we have given of them will undoubtedly cause them to be recognised and we hope shunned—the task too is so revolting—although a duty—that we beg to be excused from further comment, and we trust that those who have so often requested us to speak of this matter will consider our duty performed. Do not leave to us the whole Herculean work of attack—put your own shoulders to the wheel and make them feel their utter insignificance.

— Mr. Von Schneidaw, of Chicago, asks the following question, and makes suggestions which we consider of sufficient importance to require the attention of our readers? "Has any daguerreotype artist ever used yellow or orange cambric for making up the dark room for coating plates, &c.?"

"I prefer it and think it is more pleasant to work in, giving light, by admitting the light through it, without effecting the sensitive coating of the plate. I should think it would be of great use for operating in the field, a dark room being more troublesome to arrange out of doors, when a little tent, or frame, covered with yellow cambric, is easily put up and does not require to be darkened, on account of the non-photogenic effect of the yellow rays transmitted by it."

We recommend a trial of Mr. Von Schneidaw's suggestion, particularly by those engaged in out door manipulation.

—The following interesting communication, we received too late to place under its appropriate head. We therefore, give it a place here.

London, 1, 1853.

MR. H. H. SNELLING.—Dear Sir: I have been so much occupied, I have not had time to write you before. I will now give you a few of my observations, on the state of the daguerreotype business in Europe. In England and France, it is in a most flourishing condition. All the prin-

principal artists have as much as they can possibly attend to. Mayall has opened a new establishment in Regent street. Mr. Claudet has just improved his entrance at a cost of 1000 pounds. Kilburn, photographer to the Queen, is in his old establishment in Regent Hill, their places are handsomely and conveniently fitted up. Others call and appoint the time for sitting, so that the confusion and bustle consequent in the rush we generally have in America, of crowds of persons at one time is avoided. The great expense lavished in city galleries is also avoided and they get well paid for their pictures. For instance, a 1-6 picture which our artist in America charge \$2 for, Mr. Kilburn gets \$10; Mr. Claudet \$7,50 and Mr. Beard \$7,50, and other in proportion. In Paris, Mr. Thompson, on the Boulevards, is doing the best business, and charges prices corresponding to the above named. As regards improvements or new discoveries in the art—the process of taking instantaneous impressions on plates is very good. I have seen a number of specimens of vessels under full sail, and steamers at full speed perfectly taken. There are a variety of processes, for taking pictures, on various substances; such as wood and leather, and of life sizes, all very unsatisfactory and unsuccessful.

The paper impressions in Paris are most beautiful, after being touched by the hand of a skillful painter. Views copied from the collodion pictures, and on waxed paper are also very fine. The Stereoscopic pictures, are sold in Paris and London, by the thousand, and it is time they were better appreciated in America. My opinion is that the pictures on metal plates can never be superseded. The collodion for views is very valuable. A person who experiments with apparatus and plates larger than what we term, the double shell size, waste both time and money. I had the pleasure of visiting Madame Daguerre and son, at Bry-Sur-Marne, also the monument to Daguerre, erected by the Societe Libres des Beaux Arts, in the Cemetery at Petit Bry. It is a simple monument with a medallion likeness of the great inventor in the centre. Mr Carpenter, an eminent artist of Paris has sent a bust of Daguerre to our great exhibition. It is to be hoped that some of our eminent artists, will purchase it to adorn their

studies. I visited Professor Niepce, and he kindly showed me a number of his experiments in obtaining the natural colors. I saw a number of pictures taken with the camera-obscure with all the colors, which were rather faint, but after exposing to the light for some time they entirely disappear. Mr. Niepce, who is a Captain in the French Army, and whose atelier is in the Barracks, surrounded by guns and drums, and all that kind of things, is making interesting experiments in all branches of the art. He takes the best paper pictures from collodion of persons without retouching I have seen. He has a very curious process of engraving on steel from paper pictures, some printed proofs of which he showed me. It is high time the great curse of the miserable low price system was stopped to a certain extent in America, or it will not be long that we can boast of our superiority in Daguerreotypes, over the Europeans. Hundreds of rich and distinguished men, practice the business in Europe for amusement. The art is fostered and cherished by all the Scientific Societies, and Scientific Journals, and the immense importance of the business is beginning to be perceived and understood. Mr. Ernest Lacan, Editor of *La Lumiere*, gave a Soiree Photographique, a few evenings before I left Paris, at which nearly all the distinguished artists were present, amateurs and others, and exhibited their works. There was a fine display, and Lamartine honored the Soiree with his presence. Mr. Pottenger has just opened a fine establishment, at 41 Ludgate Hill, and I received a letter from Messrs. Terry and Litch, after their arrival in Liverpool, and I believe they intend opening in England. There is no doubt, but they will succeed. The American subscription to Daguerre's monument, although small was gratefully received, and I handed it over to A. Perin, Vice President of the Societe Libres des Beaux Arts, and it will be acknowledged in the *Revue*. There are some interesting experiments being made with an instrument, called the Broscope, or moving Stereoscope, which makes a wheel to turn around a person's hand, to move &c.; but it is not yet perfected. Christophe the maker of the scale plates, has an immense factory for the manufacture of his celebrated ware. He has received a large

order from the Emperor Napoleon, the Third. The Inventor of the *Processé de Instantance*, was sent for to London, by command of her Majesty, to take the funeral procession of the late Duke of Wellington, and by the French Emperor to take the "Wedding Procession," while moving to Notre Dame. Both efforts were successful, and the pictures are in the hands of their Majesties. No copies were allowed to be sold. If any of the above prove interesting, you are at liberty to use it, as you please.

Truly yours,
H. W. MEADE.

—It always gives us pleasure, to receive letters of the following character, as it shows that a decisive interest is being evinced by our operators generally. We should, however, be better pleased, were our operators to give us more suggestions, or remarks of more practical utility.

Dubuque, Iowa, June, 4, 1853.

MR. EDITOR—Dear Sir: Your valuable journal comes regular to hand. At first, we thought your *terms* rather *extravagant*, but having perused it pretty closely, and having considered the *quality* of its contents rather than its *quantity*, we consider it *profitable* to become subscribers to your journal. From the notices you have made of our friend Hesler, and of Mr. Whitney, of St. Paul, it is evident we have not located our business so far to the "*Westward*," as not to be considered among the civilized, or where the *Power of Light* is not made apparent. We saw in the May, No. your very deserved notice, of our friend J. C. Gray, of Jamestown, N. Y., our native place; any such notices, we assure you, will act as no small prompter to promote our art, and clothe it with that dignity of which it is so well worthy. We have been advised repeatedly by our citizens to contribute some of our skill to the World's Fair at New York, but having written to our friend Hesler, as to the prospect of *show-room* there, appropriated to our art, and he thinking there were more applications than space to admit all, we have concluded not to *exhibit*; but to strive the harder to excel. We learn that Messrs. Dobyns and Co., who were

our tutors in the art—intend exhibiting at the Great Fair, and whom we presume the World will find 'hard to beat.' We are doing a comfortable business, at good prices, notwithstanding the cheap (?) pictures frequently taken in our city.

Very respectfully, Yours.

WELLS H. WHITE & Co.

—We have had the pleasure of inspecting a series of daguerreotypes, taken by the Messrs. Meade, illustrative of Shakespeare's "Seven Ages," which not only evince much talent but a high degree of cultivated taste. It is such pictures as these that are to point out the true daguerrean artist. Any one of ordinary talent can take a daguerreotype—but it is a mistaken notion that all are capable of taking either artistic copies of nature, or even passable shadows. The seven ages of the Brothers Meade, with the exception of the infantile, are fine, much better than could have been justly expected under the peculiar circumstances and difficulties in which they were taken. We wish to see the exhibition of such pictures more general. It will bring out the poetical talents of our artists, as well as create a more refined taste. Mr. Henry W. Meade has returned from his European tour, with many gems of the art taken by him during his stay at the various places where he stopped, among them, one of the monument to Daguerre and Niepce, recently erected in France by the contribution of artists throughout the world, a fair portion of which was raised in the United States by Mr. Meade's energy. When shall we ever behold a similar one in this country?

—Mr. Gurney is taking some most exquisite specimens of the art, and treads heavily in the footsteps of our friend Hesler. He has also introduced a new style of coloring, which is quite pretty.

—Mr. North, of Cleveland, Ohio, has invented a new kind of casing for daguer-

reotypes which gives a delightful effect to the picture. It not only increases its apparent sharpness, and gives great relief, but magnifies it considerably. Mr. North is making preparations to introduce them to the daguerrean public.

— In the present number we commence our series of Photographic illustrations, by giving a crystalotype of the moon, taken by Mr. Whipple, from whom we have received the following interesting account.

MR. SNELLING—DR. SIR: I am happy to be able to furnish you with crystalotypes of the moon for July number, but have time to write only a few words in relation to my experiments in taking it. My first attempt at daguerreotyping the moon was with a reflecting telescope; the mirror was five feet focus, and seven inches diameter: by putting the prepared plate directly in the focus of the reflector, and giving it an exposure of from 3 to 5 seconds I obtained quite distinct impressions, but owing to the smallness, of the image which was only about 5-8ths of an inch in diameter, and the want of clockwork to regulate the motion of the telescope the results were very far from satisfactory.

Having obtained permission of Professor Bond to use the large Cambridge refractor for that purpose, I renewed my experiments, with high hopes of success, but soon found it no easy matter to obtain a clear, well defined, beautiful, daguerreotype of the Moon; nothing could be more interesting than its appearance through that *magnificent* instrument, but to transfer it to the silver plate, to make something tangible of it was quite a different thing. The governor that regulates the motion of the telescope although sufficiently accurate for observing purposes was entirely unsuitable for daguerreotyping; as when the plate is exposed to the moon's image, if the instrument does not follow exactly, to counteract the earth's motion; even to the nicety of a hair's breadth, the beauty of the impression is much injured or entirely spoiled; the governor had a tendency to move the instrument a little too fast, then to fall slightly behind; by closely noticing its motion and by exposing my plate those few seconds it exactly followed

between the accelerated and retarded motion, I might obtain one or two perfect proofs in the trial of a dozen plates, other things being right, but a more serious obstacle to my success, was the usual state of the atmosphere in the locality; the sea breeze, the hot and cold air comingling; although its effects were not visible to the eye, but when the moon was viewed through the telescope it had the same appearance as objects when seen through the heated air from a chimney, in a constant tremor, precluding the possibility of successful daguerreotyping; this state of the atmosphere often continued week after week in a greater or less degree, so that an evening of perfect quiet, was hailed with the greatest delight. After oft repeated failures I finally obtained the daguerreotype from which the crystalotypes I send for your Journal were copies: it was taken in March 1851, the object glass only of the telescope was used. It is fifteen inches in diameter, and about twenty three feet focal length; the image it gives of the moon varies but little from three inches, and the prepared plate had an exposure of 13 seconds to its action, the result is before you, I have since succeeded in making several others, at her different phases, equally as good as the one here represented, and I have not the least doubt, that when Prof. Bond applies his Spring Governor, (a remarkable invention of his own, for regulating motion,) instead of the one now in use, so that a plate may be exposed several minutes without danger of blurring from unsteady motion, we shall be able to present as perfect daguerreotypes of the moon ten or fifteen inches in diameter as we have in our possession of three inches; and if we are enabled to obtain a series of well executed large daguerreotypes taken at intervals of a few hours, from the first moment the sunlight strikes one side at the new moon until it again leaves it in darkness on the last quarter: taken as old Sol lights up peak after peak, shining first on this side, then on that, and as these shadows sweep through her immense cavernous valleys, then as the full blaze of the sun penetrates those awfully deep yawning gulfs, I feel that it would conduce more to a perfect knowledge of that remarkable body, than any other means we now have at command.

JOHN A. WHIPPLE.

— We call attention to the following note :—

Boston, June, 22, 1853.

MR. SNELLING—Dear Sir: Mr. Brigham, who made me an offer for, and had the refusal of the crystalotype, and was making arrangements to form a joint stock Co., has failed to comply with my terms within the time specified, consequently, it is now in my hands, and I intend to make such disposition of it as shall not give daguerreotypers cause to complain of a want of liberality on my part.

JOHN A. WHIPPLE.

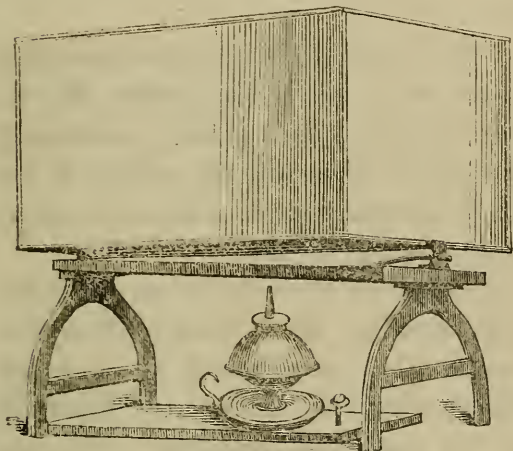


Fig. 12.

— UPTON'S MERCURY BATH—(*Patented.*)—This is a self-regulating bath as represented by fig. 12. The advantages claimed for this bath are, that by its expansion by heat it is kept at the same temperature, both in cold or warm weather, without variation, by means of a regulator attached to it and which communicates with the spirit lamp, so that, if a sudden current of air cools the bath, the flame is increased by an equally sudden enlargement of the flame, which again gradually decreases with the elevated temperature of the bath. It also has an air chamber which keeps the bath at the same degree of heat at the top as at the bottom, thus preventing the mercury from condensing and becoming coarse before it reaches the plate.

— We clip the following from the Journal of the Photographic institute :—

The brilliant success which has attended the endeavors of our distinguished countryman, Mr. H. Fox Talbot, to solve the problem of the conversion of photographic pictures into engraved plates, makes the present time a new epoch in the history of the art. We have had an opportunity of inspecting some of the products of the process described at page 54, and bear testimony to the great value of the results already obtained, and the promise they hold out for the future. Curiously enough there has again been a convergence of independent efforts somewhat analogous to that which occurred when the daguerreotype and the talbotype were announced almost simultaneously. The French scientific journals are full of a new process which M. Niepce de St. Victor had brought up to the last point before actually printing off impressions, when the news of Mr. Talbot's success arrived in Paris. There is no question, however, but Mr. Talbot's results were those first made known; and moreover, those of M. Niepce appear to be founded on a totally different mode of operation, and to be a further development of the imperfect steps made by his uncle, M. Nicéphore Niepce, with bituminous substances. We have no opportunity of judging of the comparative merits of the two inventions; but if that of M. Niepce's give better results than Mr. Talbot's, it will indeed be excellent. At present the great fact secured by Mr. Talbot is the etching of lines and surfaces of even tint; the next point, in which perhaps some of the arts of the aqua-tint engraver may be available, will be to obtain half-tints and gradation of tone. Since Mr. Talbot has, in a generous spirit and with enlightened judgment, given his process to the public, we doubt not that it will quickly receive a rapid development.

Since the preceding paragraph has been in type, a Member of the Society has directed our attention to the specification of a patent which is apparently connected with M. Niepce's process. Strictly taken, the description of this patent would include all kinds of photographic engraving, but the language used in the preamble is too vague to have any excluding effect upon processes so different as Mr. Talbot's. We may direct attention also to M. Martin's process, given at page 64.

A paper was read last week by the Rev. W. T. Kingsley before the Society of Arts, making known some very interesting experiments on the application of photography to the representation of microscopic objects. We hope to be able to give a full account of these experiments next month; but cannot refrain now from mentioning a statement made by Mr. Kingsley which, if it prove correct, will change very greatly the views held in regard to the chemistry of the daguerreotype. It has been generally imagined that the vapor of the mercury was deposited on the plate; this Mr. Kingsley denies. While on the subject of the microscope, we may draw attention to the Photographic Number of the Quarterly Journal of Microscopical Science for April, in which appear the first book-illustrations by actual photographs published in this country—very successful ones. The number contains papers on the subject by Messrs. Shadbolt, Delves and Highley, but want of space prevents us from entering upon them at present. They should be consulted by all interested in this application of the art.

Mr. Delamotte's photographic gallery, 168 New Bond Street, is deservedly attracting numerous visitors. As a select collection of photographic pictures, many of the highest excellence, this exhibition should be visited, not only by all photographers, but by all who take an interest in pictorial art.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SIL-

VER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense. E. ANTHONY.



Miss M. L. Green

Jan 1885

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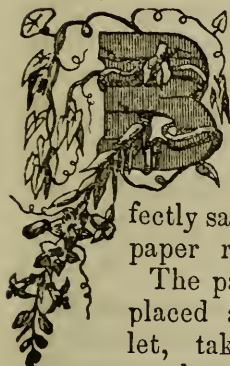
No. 2.

A GENERAL REVIEW OF THE DAGUERRETYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

PREPARATION OF THE PAPER.



By the light of a taper, the sheets of paper are placed evenly over the bath of silver, and then removed and placed away to dry as soon as they appear perfectly saturated: this is the positive paper ready for use.

The paper, being perfectly dry, is placed as ordinarily upon the tablet, taking care to lay it upon another sheet of the same paper which should extend beyond it a few millimetres† on one side, and the positive paper should also extend beyond the tablet on the same side, in order to compare one with the other: for the proof will be sufficiently acted upon by the light as soon as it has acquired a light decided coloration, by comparison with the subjacent paper.

FORMATION OF THE POSITIVE IMAGE.

The picture will appear as soon as the paper, having received the impression, is touched with the solution of protosulphate of iron. The paper is to be applied with its sensitive side to the bath avoiding the interposition of bubbles of air.

The solution might, if needful, be diluted in two or three parts of water, the image will appear less rapidly, but it will give greater facility in avoiding the bubbles of air.

Perhaps it would be better to place the

paper with the image upwards which would allow one to watch its gradual appearance. I have not sufficiently experimented on this method to guarantee its excellence; it is for artists to make trial of.

If the protosulphate of iron were prepared with hydrogen gas, by causing the production of hydrogen gas in the solution, it would be perhaps better for avoiding the excess of an acid which often gives a *yellowish grey* precipitate instead of a *black*.

For fixing, I think a protonitrate wash with ordinary water will suffice at first, followed by the ordinary baths, very slightly charged with salt. I have not as yet occupied myself with it, for the reason that these proofs, once withdrawn from the sulphate of iron, do not perceptibly change on being exposed several times to the sun; however they should be freed from the salts of iron and silver; I will give in my next article, the best process I can find: I had always employed ammonia, I will again study its action.

The pyrogallie (probably also gallic acid) produces the same affect as the protosulphate of iron; on this paper the exposition will require from ten to twenty seconds.

I have just been experimenting, with the greatest success, on the employment of the *nitrate of silver ammonical acid* on albumenized glass without any addition: I have obtained a proof positive on both sides by passing the paper through the sulphate of iron, after an exposition of fifty seconds, which had turned the coating of albumen yellow in the picture.

* Continued from page 47, vol. 6, No. 1,
† 1 millimetre equal to 30-1000 of an inch.

SECTION XIV.

ORDINARY POSITIVE PAPER.

The positive paper most in use at the present day is prepared by first impregnating the paper with salted water, and with the nitrate of silver afterwards. This paper cannot be preserved unchangeable, it gradually turns yellow and this tone affects the blacks of the proof. It is easy to give an account of the effects of this paper.

Paper free from marine salt, steeped in a solution of nitrate of silver, discolors under the action of light, and so much the more so in proportion as it is concentrated: the paper never becomes black, it touches on a *brownish yellow*, a sort of mahogany color, which it never exceeds, however long may be the exposition to the light.

The chloride of silver, on its part, in its maximum of coloration presents a blueish grey color. It is the union of these two opposed colors which produces the black known in every compound in which the rays are transmitted by one substance, and forming what is called their color, cannot pass through another substance and produce obscurity or blackness.

It appears that the continuing agents operate principally upon the nitrate of silver in way of decomposition and are almost devoid of action on the chloride of silver already discolored by the light.

The acid nitrate of silver produces its maximum of black before manifesting the least coloration, and the blacks are less beautiful when it has attained its maximum of color.

The bromide of silver blackens quicker in light than the chloride; it takes an entirely analogous color, only a little more deep; the bromide of potassium therefore might be united with advantage to the preparation of the positive paper: it can do no harm; but it is generally suppressed by reason of its high price, preferring to transfer the balance of expense to the paper.

The mode of preparation is as follows: *Gray* salt is to be dissolved in common water stirring it well to saturate the water: it is then filtered.

Distilled water is likewise to be saturated with nitrate of silver.

These two solutions are ticketed, and

laid away for use, when needed, it is to be diluted as follows:—

Water saturated with	
marine salt.....	250 grammes.*
Ordinary water.....	1000 „ †

The paper cut in sheets of the required dimensions is to be steeped in it; the only condition to be observed is that the paper should become thoroughly wet in every portion, which does not fail to take place if sufficient time is given. If the sheets are large, a flat vessel must necessarily be employed; and they must be placed one after the other on the salted water; but it will be necessary to wet both sides immediately, turning them quickly; the essential thing is to allow the water to penetrate thoroughly into the fibres of the paper. The excess of water is to be removed with bibulous paper, and as soon as the paper exposed to air is only damp, it is to be placed sheet by sheet in a bath composed of.

Acetate of silver in a concentrated solution	25 grammes. ‡
Ordinary water	100 ‡ „ §

Ordinary water does well enough in this case; for the only thing which could exclude it would be the presence of chloride capable of destroying its transparency; now, it is impossible to steep paper salted in a solution of nitrate of silver in distilled water, without producing a precipitate. The essential thing to be observed, in this case, is rather to watch that the salted paper be not too damp, so that flakes of chloride of silver may not be detached therefrom. In every case, before preparing a new sheet, it will be well to wait until the formed and agglomerated chloride has precipitated; as to that portion of the bath which only contains the chloride in an extremely disunited state, it is another reason why ordinary water is good.

It is evident that the salted paper might be prepared in the light, though it is otherwise with the passing through the nitrate of silver. Yet if the paper is only to be used for taking positives in full light, without continuation, it would be childish to confine ourselves to the taper light: a

*4500 grains, †18000.

‡430 grains, §1800 grains,

place sufficiently enlightened by the natural light to have a clear view of the paper, may serve for operating in; but the drying process should take place in the dark.

Care must be taken to mark the side of the sheets placed over the bath of nitrate of silver.

According to Mr. Martens, this paper is still preserved much better by suspending it in the air in a dark situation, than enclosed in a box.

PHOTOGENIC PAPER PREPARED DRY.

For a number of years I have been devising a method of laying the insoluble photogenic salts of silver on the surface of the paper without employing any liquid. My first experiments were, very naturally, with the precipitates, but were not attended with success. These precipitates, on drying, agglomerate and cannot be spread by rubbing over the paper.

I entirely succeeded, on the other hand, in preparing these compounds with silver leaf submitted to the fumes of iodine, bromine and aqua regia.

Lately, I have been able to make numerous new experiments which have given me still greater light.

Leaf silver (for silvering,) submitted to the vapors of iodine, is rapidly converted into transparent pellicles, which, by means of a pellet of cotton, may be spread over paper, wood, pasteboard, etc., forming a beautiful yellow coating of extraordinary uniformity.

This ioduretted paper, used with the aceto-nitrate, is not as sensitive as the common ioduretted paper, but, for this very reason, it can be used for obtaining positives by continuation, as it gives very intense blacks with gallic acid.

The bromide of silver is prepared by placing the silver leaf near a clay saucer containing bromine covered with water. I have remarked that a little iodine placed at the side of the saucer facilitated the corrosion by the bromine. The dry bromide of silver thus produced has a slight rose colored tint.

The chloride of silver is obtained by placing the silver leaf near a saucer filled with concentrated aqua regia: it displays itself in beautiful white pellicles.

The bromide and the chloride of silver

are not so easily spread over the paper as the ioduret; they blacken rapidly in the light, but they never give an intense black.

These compounds cannot in reality be used with the ordinary positive paper, when sketches from negatives are to be taken, or a negative in a small sized frame is to be copied, for headings of letters or other ornaments, they become of very convenient use; it will be sufficient to insert between the paper and the pellet a thin pasteboard or metal card cut according to the required form.

CONTINUATING LIQUIDS THAT MAY BE SUBSTITUTED FOR THE GALLIC AND PYROGALLIC ACID.

For a long time I have intended trying the reducing property of the juice of mushrooms and walnut husks.

I had occasion lately to make the experiment. Water boiled with the large kind of wood mushrooms, of a greenish yellow color, causes the image to appear but slowly; if some of this water be added to the nitrate of silver, before steeping the paper, the discoloration of the paper attains a brownish black of great intensity.

As to the walnut husks,* it is otherwise, it brings out the picture as rapidly, if not still more so, as the pyro gallic acid; but their appearance is different; they do not seem so clear, particularly by transparency; to be viewed thus they lose considerable of their power, which seems owing to the nature of the blacks, which are at this moment of a greenish gray. However, like the positives the proofs possess sufficient tone.

For these reasons I am persuaded that the addition of walnut husks to the gallic acid will produce a very powerful black, and, in every case, a great number of artists will find in this substance an extremely economical liquid, especially in the country and in the distant places where one gets out of gallic acid.

Vegetable productions that may advantageously take the place of gallic acid are doubtless very numerous: I have no doubt that very soon, a series will be given from

* This liquor is prepared by mixing the water with the back of the green nuts and filtering: it may be prepared in an instant. I do not know whether it is better when old and boiled,

which may be chosen, that best appropriate to the productions to be obtained.

I have also made some new experiments with the protosulphate of iron; contrary to my expectation, the protosulphate of iron, with a large addition of nitric acid, so as to form a brown liquid, still brings out immediately invisible images, owing to the change by the light of the acid nitrate of silver.

There is in this method, as well as in the employment of the vegetable sugars, matter for numerous receipts: it remains with photographers to study, for themselves, and to apply it to the different cases.

ORDINARY POSITIVE PAPER.

I have been investigating different counteracting liquids with the design of increasing their number for the use of artists who might be in want of the gallic and pyrogallic acids, and also to class them according to their power of operating.

They are the following from the strongest to the weakest:

Pyrogallic acid; Photosulphate of iron; Walnut husks; Gallic acid; Tannin;* Tanner's fluid found in tanning pits; Tan water.

The three first liquids require the employment of nitrate of silver *highly acidulated*; their effect is almost instantaneous which renders their employment very difficult for paper.

The four other preparations succeed with the nitrate of silver barely acidulated, with the neutral nitrate (melted) and even with the nitrate saturated with silver by ebullition with silver leaf.

This last nitrate gives the most beautiful blacks? The following is a complete process: a solution is prepared composed of:

Nitrate of silver	15 grammes	270 grains.
Common water	50 "	900 "
Alcohol	50 "	900 "

Sulphuric or nitric acid, a mere tinge.

The object of the alcohol is to cause the liquid to penetrate into the paper.

The acidulation is for the purpose of allowing the preparation of the plate by the natural light; for this acid is useless if the

gallic acid, the *tannin*, or the tan waters, are used alone as the continuators. If ordinary water or sulphuric acid is employed in making the bath, it will be well to filter it before use, to free it from the crystals of chloride and sulphite of silver which might fix on the paper. The acid ammonical acetate of silver; the preparation of which I have described furnishes also an excellent bath. If blacks of greater intensity are desired, it will be necessary to increase the proportion of nitrate of silver; for the concentrated solution is certainly the best, adding thereto its bulk of alcohol.

The filtered bath having been put in a vessel of larger dimensions than the sheets, they are to be placed one after the other flatly upon the surface of the liquid; as soon as the paper appears wet, the sheet is to be removed, and having left it to drain for a few seconds, it is to be placed away to dry, either laid flat upon *new* common paper, or else by suspending the sheets fastened with pins on a row of corks as indicated by M. de Valicourt. The paper may be thus dried in a moderate light of sufficient strength to allow one to see his operations. When the proof is dry, it is ready for use. If the paper has been prepared with the sub-nitrate of silver, it cannot be preserved, the acid in excess gives more fixidity to the paper. For greater certainty, before using paper prepared some days before, dip a piece of it, unchanged by the light, into the continuing bath which is to be made use of; if, at the expiration of five minutes, the part immersed is not more discolored than the dry positive the paper will be fit for use the whole day.

The preparation of the common acetate-nitrate may be used for the same purpose, provided sufficient nitrate of silver be added to give beautiful black tones. Gallic acid or tannin in solution may be added thereto, taking care to filter immediately before steeping the paper; in this case, the paper exposed to the light is allowed to take a bistre color before submitting it to the continuing liquids.

The advantage of this process is: 1st.—to avoid the employment of the ioduretted paper: 2nd.—to better judge when the proof is taken, by the color of the exposed paper: 3rd.—to simplify the operation of fixing.

* The substance used to change raw hides into leather.

In fact, on withdrawal from the continuing bath, the proof becomes very nearly fixed by washing plentifully with water. To complete the operation, the proof is allowed to remain in water acidulated with nitric acid.

This acid gives great brilliancy to the whites, without destroying the mezzotints. If the blacks are not sufficiently intense or draw to a bistre tone, it will suffice to add to the acidulated water, a weak solution of hyposulphite of soda, after having removed the proof, which is to be replaced in the mixture as soon as the deposit of sulphur shall have given it a milky color. By this means the blacks will gradually increase in tone, passing over the fillemot color, to attain an India ink black.

The pyro-gallic acid, the protosulphate of iron and walnut husks can only be used for paper when diluted with large quantities of water, renewed for each proof and employed largely for a single impression. For negatives or positives on albumen and collodion, they will be preferable.

I am convinced that a proof on paper is not obtained by the sulphate of iron, if steeped on its reverse side, or passed through water in the first instance to facilitate the primary imbibition. A proof washed before hand with water comes out, although somewhat feebly with the other continuing liquids of the gallic acid nature; but this precaution is useless, since the picture does not come out instantaneously, which gives time to evade the bubbles of air.

Positive proofs with the chloride of silver alone are not continued by the protosulphate of iron and, for a stronger reason, gallic acid and the other analogous acids; but the pyro-gallic acid continues therein in a very perceptible manner. It may consequently be employed when an impression on positive paper is deemed too light.

Walnut husks should be used filtered and very freshly prepared; as soon as it has been browned by the air, its effect is

quite different. Tan water should be filtered with coal to remove from it as far as possible its coloring principle which often fixes on the whites. That which has rested on the skins in the tan pits, colors the paper least; it will suffice to filter it through cotton.

The consequence of all this is that the ordinary positive paper is preserved much longer, by employing, after the salted water, nitrate of silver acidulated with nitric acid. These are susceptible of indefinite preservation if they are kept enclosed in an apartment, where a saucer containing nitric or chlorohydric acid has been placed; for it seems sure that their change depends solely on the loss of the acid of the nitrate, a phenomenon which is as well caused by time as light.

These are the imperfections of the old style of paper which have induced me to occupy myself in the production of a new positive paper; they are numerous and fundamental; this may well be perceived by comparing the perfection of an impression on albumen or collodion with its positive on paper; this is very naturally attributed to the grain of the paper, while the cause is totally different.

I have already observed that a proof cannot be fixed without completely destroying the most volatile tints; there is another imperfection not less grievous of which I have not yet spoken; this is the unfitness of the ordinary positive paper for giving a counter-proof of a tone identical in value with its negative; in other words, the common positive paper is very far from giving blacks proportional to the whites; it blackens very quick, then, so to speak, it suddenly pauses.

At the expiration of 20 seconds in the sun, for instance, it will not become more perceptibly blackened than at the end of 10 seconds, whilst the difference between an exposition of 5 and 10 seconds will be much more acceptable.

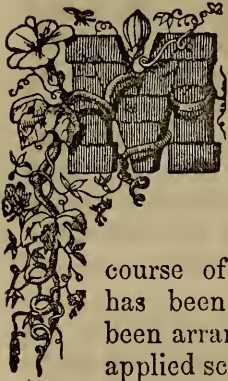
M. A. GUADIN.

To be Continued.

From the Quarterly Journal of Microscopical Science.

ON THE PRACTICAL APPLICATION OF PHOTOGRAPHY TO THE ILLUSTRATION OF WORKS ON MICROSCOPY, NATURAL HISTORY, ANATOMY, &c.

BY SAMUEL HIGHLEY, JR.



ANY scientific phenomena, when first discovered, either from their remarkability or beauty, have excited much interest in the popular mind, but have only been regarded by it as pleasing toys, till in the course of time their practical value has been discovered, and they have been arranged thereafter in the list of applied sciences.

Such was the globe of water, magnifying in distorted form the fly or flower, till in the hands of science it sprung into that exquisite refinement on optical knowledge, "the microscope," that discoverer of hidden worlds and life, and the seat or form of disease within the inmost walls of the human frame. Such the kaleidoscope, the tin case with its bits of colored glass, regarded long, only as a wonder from the fair, till in practical hands we find ourselves indebted to its aid for many of the beautiful geometric designs which ornament our walls or floors.

So likewise was the camera-obscura, the discovery of Baptista Porta, of Padua, till the progress of chemical knowledge discovered to us the means of fixing its fleeting shadows; and even then its product, together with its adjunct, the stereoscope, was little thought of in its most valuable practical bearing; but of late this has rapidly impressed itself upon us, and we cannot as yet see the limits of its utility.

In Microscopy, Natural History, Physiological and Pathological research, what an invaluable agent will Photographic art prove; for Nature here depicts herself with her own pencil, and, in all probability, ere long from her own palette; and in this resides one of its greatest values, for *truthfulness* is insured, and our studies delineated with a faithful and unbiassed hand; and with what minuteness of detail, the photographs from the microscope, as we

have presented to our view what the eye itself would only see if directed to the field of that instrument, we may expect many valuable records of histological research soon to be in circulation, to elicit further investigation.

In delineating the peculiarities of the geological features of a country, or of its Flora and Fauna especially, where species that could not be acclimatized to other regions are concerned, the naturalist will appreciate its aid.

To the old complaint of the surgical anatomist, that little can be gained from flat surface plates, a new atlas may be opened by the application of the stereoscopic principle to photographs of well-dissected surgical parts.

To the physician it offers a means in many cases of conveying to the student an idea of the "Physiognomy of Disease," as already has been shown by Dr. Diamond's interesting collodion series of 'Types of Insanity;' whilst in the accident ward, or the operating theatre, the exact delineation of many a curious and interesting case might, in a few seconds, be added to the records of its hospital, when time and the restlessness of the sufferer would not permit a draftsman to exercise his art.

Convinced of the value of this beautiful art, the offspring of physical and chemical science, it is with a considerable degree of gratification that, as one of the Publishers of the Microscopic Journal, I am enabled to lay before the world in the plate which accompanies Mr. Delves' paper its first practical application as a printing process to the illustration of scientific literature, a field where it will be mostly appreciated. And it is to the principles involved, and the processes and apparatus employed, that I devote this paper, for the information of those of our readers who may be unacquainted with the details of Photography.

Photographic phenomena are dependent

on the power of certain rays, of which white light is composed, to effect the decomposition of certain chemical bodies when presented to their action.

When white light is decomposed by the refracting influence of a glass prism, it is resolved into a spectrum, which appears to be constituted of seven rays, viz., violet, indigo, blue, green, yellow, orange, and red; and the experiments of Sir John Herschel and Professor Stokes prove the further extension of the violet rays into lavender and spectral blue rays, and the red into a crimson ray, though these are not visible to the unassisted eye. Sir David Brewster has, however, proved that this spectrum consists only of three primary rays, blue, yellow, and red, which overlap each other, and thus by their combination produce the other spectra. These primary rays may be recognized in every part of the visible spectrum, and each seems to be possessed of a different physical property: thus *Thermotic* caloric, or heating effects reside in the red rays, *Light* or luminous effects in the yellow rays, and the *Actinic* or chemical effects in the violet and the rays beyond it.

Photography (light-drawing) and Heliography (sun-drawing) seem therefore to be inappropriate terms, since the *light-giving* rays are by experiment shown not to be the chemical agent in the phenomenon, and artificial light produces actinic effects as well as the sun. But as, whenever photographic effects are produced, actinism is the agent, I would venture to suggest that the term *Actinography* would appear to be most correct.

When surfaces prepared with agents sensitive to the actinic rays are exposed to light, a molecular change sets in, and the surface darkens all over; if, however, we protect any part, as by interposing a piece of black lace or a transparent print, we obtain a faithful outline of the first and an imprint of the second; but in both instances the natural appearance is reversed, for the parts exposed most to the light darken, whilst those parts protected remain white; thus the black lace placed on light paper appears white on a dark ground; whilst in the picture all the lights appear as shades, and the shades as lights. Such prints are called *Negatives*, and wherever this interchange of blacks for whites or

lights for shades occurs, the result belongs to this class. If, however, we again print from these, the dark ground or shades protect the surface they are laid on, and they then resemble the originals; such are called *Positives*, and this term is applied in all cases where the lights and shades are represented as in nature.

When we are operating on transparent media, this power of reversing natural effects is of the greatest value, as it presents us with the means of obtaining what is analogous to engraved plates, from which we may print numerous copies, having all the effects true to nature; and it is to this circumstance that the Collodion Process offers such advantages, on account of the transparency, together with the modulations and depth of tone of the reversed or *negative* pictures obtained.

It is to the production of Collodion *negatives* in their application to natural history and anatomical subjects, and the method of printing *positives* from them, that I devote the following description of the various operations; and although these are described as when conducted under the most favorable conditions, this course is preferred, that a guide may be given to others as to the general principles of the arrangements necessary, but which may be modified according to the position and circumstances under which they may be placed, or the extent to which they may feel inclined to carry their experiments.

THE OPERATING ROOM, wherein the negative plate is taken, should be situated at the top of a house in a clear atmosphere; if possible, it should command a northern and southern aspect: where, however, only one aspect can be obtained, the northern is preferable, as it is exempt during the greater part of the day from the direct rays of the sun, and the actinic action over different times of the day is more uniform from this direction. This is divided into two compartments,—one, being the light room, contains the Object Table, the Background and indicating Frame; the other, the dark room, contains the Camera, the table, sink, and necessary materials for coating, developing, fixing, and washing the plate.

THE LIGHT ROOM is built of glass, with the exception of a skirting, which rises about two feet from the floor. Within the

panels are fixed rollers with black and white blinds, arranged so as to give the operator a thorough command over the direction and amount of light admitted,

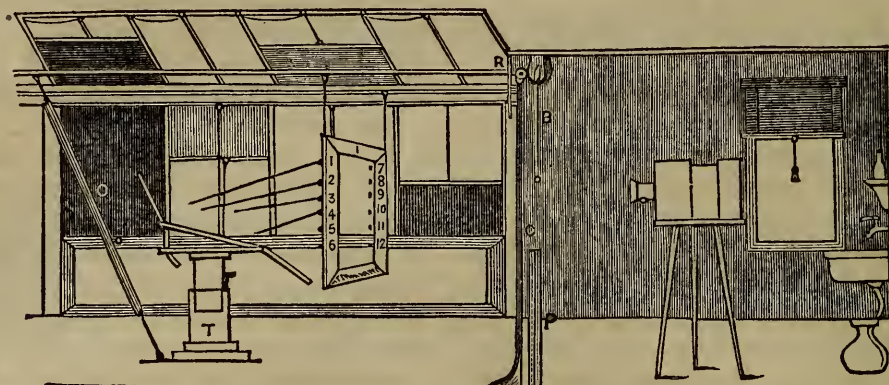


Fig. 1.

as may be readily understood by reference to fig. 1.

THE OBJECT TABLE I have planned (T, fig. 1,) is so contrived on a cylindrical pedestal, that the object can be raised and lowered, or turned to one side or the other, with a facility, so that different parts can be arranged at any angle that may be required, as when taking an anatomical view from a dead subject.

THE BACK-GROUND (G) usually consists of a short-napped blanket, or a piece of nankeen cloth stretched on a frame. This is suspended by rings on the rods R R, which run across the sides of the room, so that it admits of being adjusted at any distance from the object; it may either hang perpendicularly, or gradually slanting from the object, which gives the appearance of a receding background to the picture. The best effect, however, is produced by using a very long and rough napped blanket, placed from three to five feet behind the object; and whilst the picture is being taken, swing it from right to left by means of a cord attached to the frame: this produces a clear transparent background, which throws the object out into bold relief with excellent effect.

THE INDICATING FRAME (I, fig. 1,) I have contrived, consists of a broad, flat, black wooden frame, on the sides of which are painted white letters or numbers, and a fine wire, having free movement, corresponds to each letter or number, so that, if its end is dropped on any particular part of the object, we can refer to it by giving the letter or number at its origin on the

frame; any other lettering, as the name of the object or that of the producers of the negative and positive, may be neatly written in with a chalk-pencil on the upper or lower bars. The top and bottom bars can be removed and replaced with others of different widths, so that the frame may be increased or decreased in width at pleasure. This is likewise suspended from the rods R R, and is so adjusted that the object is seen through it whilst the frame itself occupies the margin of the picture. By this arrangement the *positive* print gives a counterpart to which the type of the work it illustrates refers, and at the same time gives a finished appearance to the picture, whilst it also saves the expense and trouble of afterwards engraving the references, &c., on the plate.

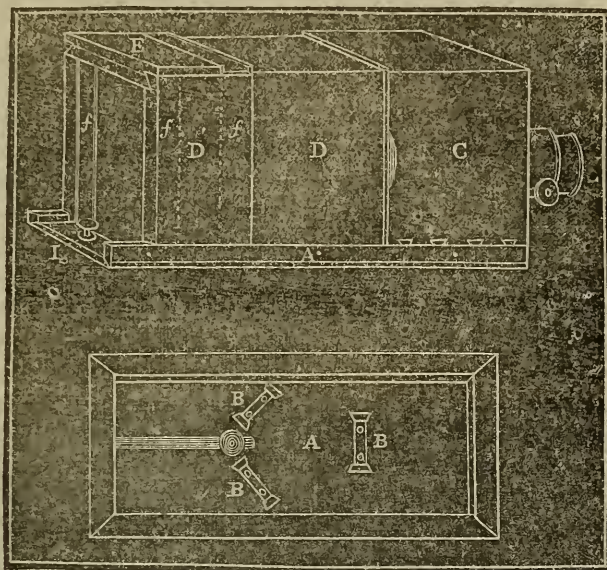
THE DARK ROOM is separated from the light by black curtains C, which can be drawn from each side towards the centre, the partition P, and a black blind B, which draws down, so that the room may be made impervious to white light, when the picture is to be made sensitive or developed. At other times the curtains and blinds are drawn together so as to cut off the light which comes from beyond the margin of the Indicating Frame. A window of glass, stained yellow by oxide of silver, or common glass with two or three folds of yellow glazed calico strained over it; or, according to Mr. Wilkinson's observations, a window may be made of sheet India rubber, about 1-32nd part of an inch in thickness, is placed at the side for observing the development of the negative. The yel-

low media being employed to cut off the actinic rays from the light admitted, which would otherwise affect the sensitive plate. The sink is lined with gutta serena and drains off into a carboy placed for the reception of the washings, which contain silver, and are worthy of consideration in the economics of large photographic establishments; the water being at convenient opportunities evaporated off, the resi-

due should be preserved, till a sufficient quantity is collected, to reduce the silver it contains, or convert it into a useful salt.

THE CAMERA, or dark chamber, is usually constructed of well seasoned walnut-wood, in a manner similar to that figured above.

It consists of a base board *A* (figs. 2, 3), 18 inches long, to the under surface of which are screwed three brass plates *B B B*



Figs. 2 and 3.

(fig. 3): to these the spring legs, hereafter described, are attached. To guard these plates and the clamp-screw *I*, a stout bead, about $1\frac{1}{2}$ inches deep, runs round the margin of the board, and is planed so as to stand perfectly true on any level surface. To the baseboard is attached the front of the camera *C*: this is square and $6\frac{1}{2}$ inches long laterally, into this slides *D*, the telescopic part of the back of the camera, which is 6 inches long. This should fit with great accuracy, that it may move smoothly and not admit any light into the interior. *D'* is the part that receives the focussing glass and plate-holders; laterally it is $4\frac{1}{2}$ inches long; in other respects it corresponds with the dimensions of the front of the camera *C*. The top of this portion, *E*, is only about $3\frac{1}{2}$ inches wide, and is moveable, sliding in two horizontal dovetail grooves in the sides of *D'* leaving an aperture for the reception of the plate-holders, either at the back or towards the front of *D'*, according as to whether it is pushed in the di-

rection of the lens or drawn from it. *ff* are perpendicular grooves in the sides of *D'*, into which the focussing-glass and the plate-holders are accurately adjusted, so that the plates and the ground glass may occupy exactly the same plane. By this arrangement, together with the rackwork movement of the lens, a range of foci, varying from 5 to 18 inches, are obtained. The replacement of the ordinary trap by the sliding trap *E*, I have found advantageous.

In the front of *C* are two perpendicular dovetailed grooves, *G G* (fig. 4), into which slides the board carrying the lens *F*, which can be fixed by means of the clamp-screw *H*, at varying heights. This movement of the lens allows the image of the object to be centered on the focussing glass without disturbing the parallelism of the camera to the object itself, as otherwise it would be necessary to resort to the objectionable mode of tilting the camera, to obtain a proper distribution of fore ground. The interior of the camera is usually black-

ened, but M. Laucherer states, that by whitening it, he has found the time of exposing the plate lessened, and that there is greater uniformity in the distribution of the lights and shades in the pictures obtained; but this method has been found by others to be objectionable.

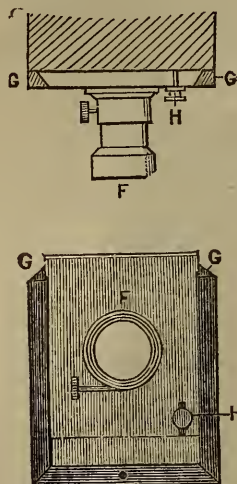


Fig. 4.

THE FOCUSsing GLASS consists of a plate of ground glass fixed into a frame of wood about 1 inch in thickness, in such a manner that when the frame is dropped into the grooves *ff*, it shall *exactly* coincide with the position the prepared surface will occupy in the plate-holders when placed in the same grooves; in other words, both focussing-glass and sensitive surface must be equally distant from the lens. The ground glass is ruled with squares and circles in pencil to correspond with the sizes and show the position the various sized plate-holders occupy in the camera; and in focussing, the image of the selected portion of the object is made to occupy that sized circle which corresponds with the size of the plate on which the picture is to be taken. When the focussing glass can be used in the front grooves, the back part of *D'* serves as a shade whilst obtaining a sharp image of the object. In focussing, the rough adjustment is obtained by means of the telescopic movement of the camera; the fine adjustment, by the rackwork or sliding movement of the lens.

After a satisfactory image is obtained, the back part of the camera is clamped by means of the screw, which runs in a slit in the base board.

THE PLATE-HOLDER consists of a wooden

frame (fig. 5) *K*, about 1 inch thick, which exactly fills up the aperture that may be made in either the back or front part of *D'*, and the grooves *ff*, into which it slides. Into this frame may be fitted two glass-plates,* between which sensitive paper is placed; or these may be replaced by various plate-holders suited for the different sized plates. These are made of oak slabs, of the thickness of the *two* glasses, having apertures cut through them suited to the size of the plate they are intended to hold, and of the shape shown in fig. 5. Across the angles of these apertures are let four pieces of black glass, *M M M M*, of the same thickness as one of the glass plates. On these corners is dropped the prepared glass or metal plate *N*: the sensitive surface thus occupies the same plane as paper would between the glass plates. A sectional view of glass and wood plate-holders is given in fig. 5, the references being the same as in the back view. In vertical side grooves, and in front of the holder and plate, works the slide or shutter of the frame *O*: this is hinged, so that when it is drawn up it may be bent over the camera so

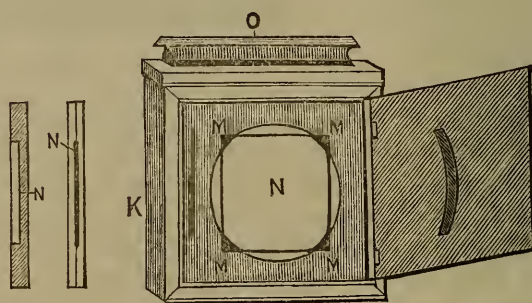


Fig. 5.

as not to be in the way whilst operating. A door hinged into the side of the frame, closes in the plate up to the proper position when the door is closed and hasped.

Cameras are constructed in various ways, so as to render them simpler and cheaper, or more complicated and costly, but the form described is a very good type of what a working camera should be. What are called hinged portable cameras are just costly refinements, excepting where lenses

* This or any other glass that may be interposed between the light and sensitive surface should be tested, according to Professor Stoke's recent experiments, to see if it be of a kind that will cut off the actinic rays of the spectrum.

of long focus or that cover a large field are employed, for as a certain space must be occupied by the chemicals and apparatus, &c. required for the various operations, this may just as well be arranged for in the interior of the camera, which then serves as a packing case, and is ready for use as soon as the box containing the materials is removed from it. If the form of the camera described is used for traveling, a handle should be in flush with the top of *C* (fig. 2.)

THE LENS.—Photographic lenses are of three kinds, the single—the single combination—and the double combination,—which are selected for use according to the nature of the object to be taken.

The desiderata in a lens are, sharpness of definition, over the whole of a *flat field*, *depth* of definition, coincidence of the plane of chemical or actinic focus with that of the visual; in other words, the lens

should be free from spherical or (relatively) chromatic aberration—I say relatively, for *photographic* lenses are not absolutely free from chromatic aberration, for part of the thermotic and the actinic rays are combined, those rays of the spectrum which produce the visual effect being present in the focus and in the same plane with those which combine to produce *actinic* effect, whilst lenses intended to be used *visually* combine only those rays which have the greatest intensity in producing *light*.

As the term "*achromatic*," in relation to the correction of photographic lenses, involve an erroneous idea, Mr. Hunt has lately proposed the term "*diactinic*" for those bodies which are transparent to the chemical rays, and "*adiactinic*" for those which are opaque to them.

Spherical aberration is attributable to the incident rays *M* (fig. 6) not being equally refracted through different parts of the lens,

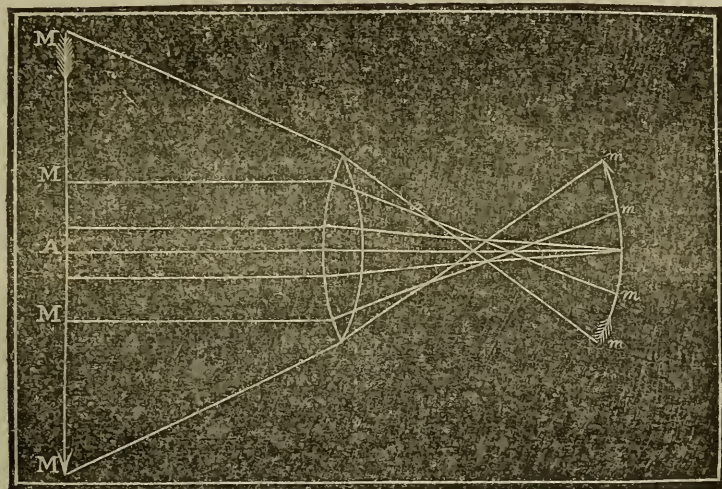


Fig. 6.

the rays nearest the axial ray being less refracted than those nearer the marginal rays *M*, consequently they are collected at different foci, as is shown in fig. 6; the result being a confused image of the object on the focussing glass, bright and sharp in the centre, but gradually passing off into a hazy halo towards the edge. This is dependent on the form of the lens—the greater its convexity, or the greater the inequality of the curves on its two faces, with reference to the direction of the incident rays, the greater will be the spherical aberration: it is therefore less in a lens of periscopic form, which renders the margi-

nal rays longer than the axial rays when the concave side is presented to the object.

Spherical aberration is still further corrected by placing a *diaphragm*, or *stop*, at such a distance before the lens that it will just admit the rays of light from the object and thus exclude the marginal rays, as in fig. 8. In proportion, however, as we decrease the size of the aperture of the stop, we increase the sharpness of the image and the size of the field, but the operation of exposing the sensitive surface is prolonged in consequence of the amount of light thus cut off. This decrease of actinic power, by the use of stops, is gene-

ally in the proportion of 1, 4, 8—thus *cæteris paribus*, if with the largest aperture a picture was given in one minute, the smaller aperture would require four minutes, and the smallest eight minutes, to produce the same effect.

Chromatic aberration is dependent on the unequal refrangibility of each of the colored rays into which white light is decomposed whilst passing through the refracting substances of a lens.

As the red rays of the spectrum are

least, whilst the violet rays are most strongly refracted, it is evident that the violet or *actinic* rays, A, will be collected at a shorter distance from the lens than the red, or *thermotic* rays, T, as is shown in fig. 7. The space between A and T constitute the *chromatic aberration*, and within it are situated, at various points, the intermediate rays of the spectrum. At the point of intersection of the violet and red rays is situated the yellow or *luminous* rays and point of *visual foci*, L L. If therefore we

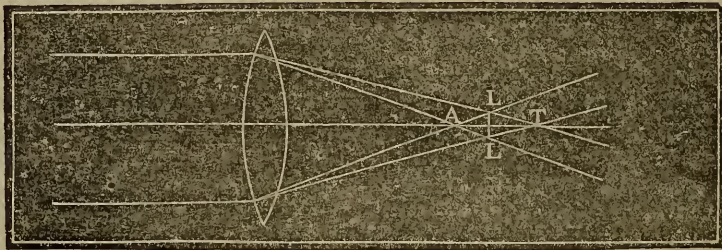


Fig. 7.

obtained a sharp image on a focussing glass placed at L L, it would be necessary to place the sensitive surface at A, to obtain a photographic picture with an uncorrected lens: this difference between the chemical and visual foci, in a single crown glass lens, usually amounts to about 1-37th of its focal length.

A simple mode of testing whether the visual and chemical foci are coincident, or the amount of aberration between the two, so that, in case of non-coincidence, the proper photogenic focus may be indicated, is by placing the camera before a flight of miniature steps, numbered on their faces from 1 to 7 consecutively, then focus for number 4 the centre step, take a photograph of the steps; if 4 appears sharper than the other steps or numbers, the chemical and visual foci coincide; on the other hand, if a number nearer to the plate is most distinct, the chemical focus is shorter than the visual, which indicates that the glass is under-corrected; if a number further from the plate is most distinct, the chemical focus is longer than the visual, which indicates over-correction, and the photogenic focus will then be behind instead of before the visual focus.

When lenses are used that have not these two foci coincident, a scale indicating the variation between the chemical and visual foci at different focal lengths should

be marked on the draw-tube of the lens or the telescopic part of the camera.

Chromatic aberration is corrected in single lenses by the form of the lens, the meniscus being the best, and by cutting off the marginal rays, in which chromatic aberration is chiefly resident, by means of a stop, S, as is shown in fig. 8.

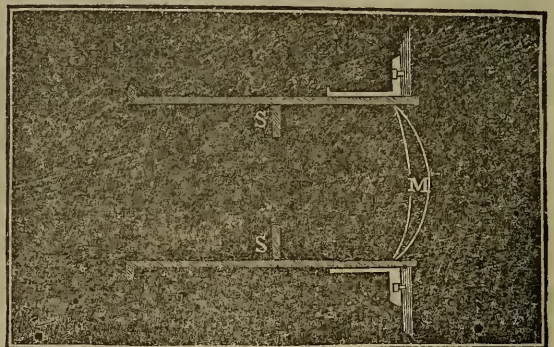


Fig. 8.

The most effectual mode of correcting chromatic aberration is by combining two lenses of media possessed of different refractive and dispersive powers. This is usually effected by employing a double convex lens of crown glass, the refractive power of which will place the focus of the violet rays at *v* (fig. 9), and the red rays at *r*, and a plano-concave or double concave of flint-glass, the refractive power of which would place the violet rays in focus

at v' , and the red rays at r' , the result being the recombination of the various rays into which white light, and the pro-

duction of an achromatic image at a mean point dependent upon the focal lengths of two lens.

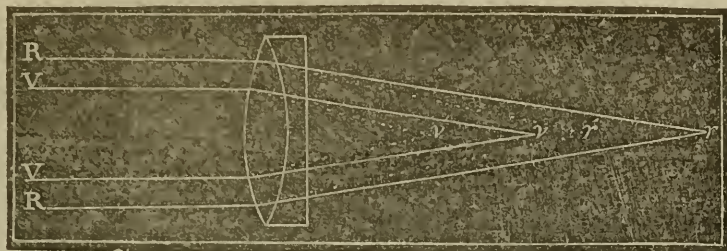


Fig. 9.

The *perfect* correction of the chromatic aberration is solely dependent on the proper ratio of the curves of the flint to the crown glass lens, and according to Mr. Ross's experience, *diactinism* can only be determined by trial with each individual lens.

The experiments of Professor Stokes, Malaguti, and Sir John Herschel, warn us that care should be taken in selecting for the construction of photographic lenses such glass and cements as will not impede the actinic rays.

A *refractive aberration* is common to many lenses producing images wherein straight lines are represented as bulged inwards or outwards. This defect is gen-

erally confounded with spherical aberration: whereas it is dependent on the *media* of the lenses refracting more strongly at the marginal than at the central part of the lens, consequently bending *outwards* those portions of a line which are nearest the margin, and producing a pincushion shaped image of a square, or *inwards* producing a barrel shaped image of a square, according to the form and position of the lens.

As the *single lens* is slower in action than the double combination, but as it gives a larger and greater *depth* of definition —by which term is meant the power of a lens to take in near and distant objects with equal distinctness*—it is therefore best adapted for landscapes and immove-

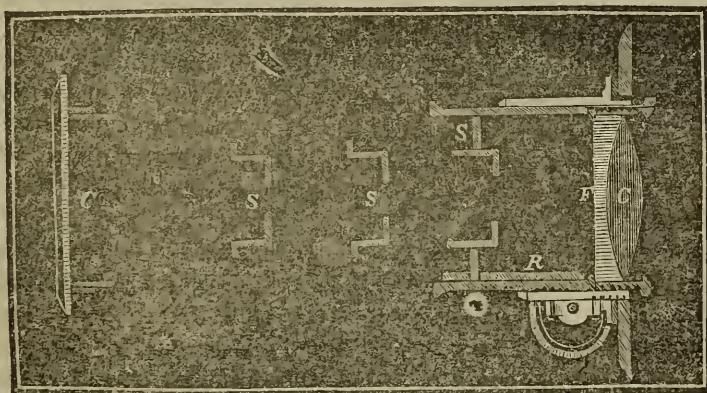


Fig. 10.

able objects, as time, which is then of no object, can be allowed for bringing out the detail of the picture.

Fig. 8 represents the section of a single lens or objective, which is used on account of being cheaper, and taking in a larger field.

Fig. 10 represents a *single achromatic lens*, in section, constructed according to

the principles of correction described, with stops S; cap. O; and rackwork adjustment R.

* The best instance I have seen of this is in Pretsch's view of Vienna, taken by a Ross's lens, and exhibited at the late Photographic Exhibition at the Society of Arts. On the front of a house, situated about *four or six miles distant* from those in the foreground, the name of the occupant is discernible.

With the *double combination lens* (fig. 11) two corrected lenses are employed; and the aperture or diameter being greater | in proportion to the focal length than in the single lens, it is more intense and quicker in action, therefore best adapted

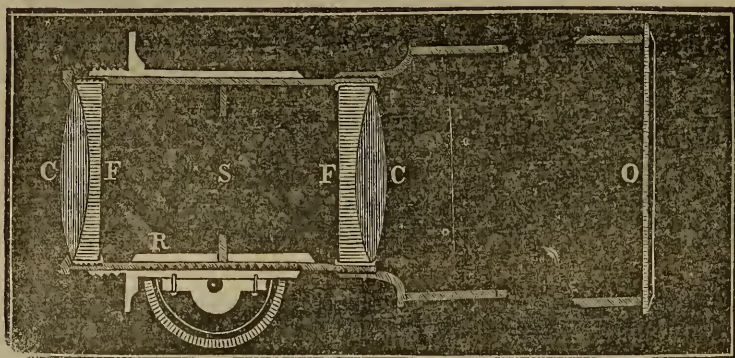


Fig. 11.

for taking portraits, pictures of animals, and other moving objects, though the image is considerably reduced in size. The references S, O, R, in this sectional diagram correspond with those in fig. 10.

MICROSCOPIC OBJECTIVES usually consist of three, sometimes only two compound lenses; but as they are over-corrected, the

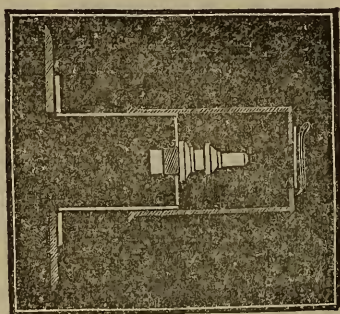


Fig. 12.

chemical and visual foci do not coincide, therefore must be compensated for. As it is important that the sensitive surface should be parallel to the object-glass, and having found difficulty in centering the body of the microscope to the camera, according to the mode recommended by Mr. Delves and Mr. Shadbolt, I have adopted the arrangement shown in fig. 12: a piece of tube is screwed into the flange of my photographic lens, and into a plate with which one end is closed, is screwed the object-glass; over this tube smoothly slides another, likewise closed at one end, but having an aperture corresponding to that of the lens: to this is attached a piece of metal, on which slides the clamping slide-plate, remov-

ed from the stand of my microscope; or two springs may be screwed to the front of the outer tube, the purport of either being to hold the microscopical slide or object. A scale, showing the difference between the chemical and visual foci, should be marked on the inner tube. With high powers a lever fine adjustment is necessary. To those photographers who have not microscopes, this will be found an economical mode of adapting lenses to their cameras, as the stand of the microscope is dispensed with.

THE STAND, in its simplest form, is made by fixing three spring legs, of the construction shown in fig. 13, into the brass sockets B B B (fig. 3,) and thus forming a steady tripod, which allows the camera to be easily adjusted in any position, and combines the advantage of extreme portability. There are many other forms more expensive or less portable, but which have advantages under some circumstances. Amongst the latter is the stereoscopic camera stand, which admits of that instrument being fixed at different angles.

ARRANGING AND FOCUSSING THE OBJECT.—The proper position of the object can only be learnt by experience, as it depends upon an artistic appreciation of the arrangement of light and shade, combined with a perfect knowledge of the chemical effect of light when radiated from surfaces



Fig. 13.

of different colors. In anatomical subjects flaccid muscle should be padded up with cotton wool into a natural appearance of rotundity, the distinction between veins and arteries being obtained by employing colored injections possessed of different actinic actions; and all parts that do not tend to a clear idea of the object should be cleanly cut away. A dark drab cloth should be thrown over the Object Table, to cover its mechanism, and to form a background to the object. After the object has been satisfactorily displayed, the indicating wires should then be adjusted to any parts that are to be specially described. Skeletons may be suspended from the rods R R (fig. 1) by cords, or supports, *of the same color as the background*, to prevent their prominence in the picture. Shadows of window bars, &c., must never fall across the object. Living animals should be taken at favorable moments, as when dozing in a standing posture, or on the look out for food; if wild, they should be induced to one end of a long, well-lighted den, whilst the lens is inserted between the bars at the other. Birds, reptiles, and some animals of a torpid nature, form very favorable subjects for operating on. It should always be endeavored to get all parts of the object in as nearly the same plane as possible; if this cannot be attained, a small stop must be inserted to obtain greater *depth* of definition with the lens, to prevent distortion of the natural proportions. The light should fall in parallel rays on the object, and the camera placed directly opposite it, and in such a position that strong rays of light do not fall upon the lens or intervene between it and the object. The lens should be adjusted so as to be *perfectly parallel* with the object; and if this is near, and inclines backwards from a plane vertical to the lens, a plateholder working on an axis may be adjusted to a position parallel with the object.

A simple mode of ascertaining whether the camera is level is by placing a marble on its top; when level, of course the marble will not roll in any direction; this likewise applies to the levelling stands. When, by focussing, a sharp image of every part has been obtained on the ground glass, the camera is clamped, or, if working with an uncorrected lens, the variation between the two foci must first be allowed for. If a

stereoscopic view of the object is to be taken, the camera may be moved round about six degrees to one side of a line central with the subject, and a particular part focussed on a fixed spot of the ground glass; the camera is then moved round to a corresponding degree on the other side of the central line, the same distance from the object being preserved, and the same part again focussed on the same spot. The two Photographs, taken at different points of view, when viewed in juxtaposition stereoscopically, resolve themselves into one image, with an appearance of solidity and elevation.

With microscopic objects beautiful effects of light and shade may be produced by the employment of polarized light, as the varying thickness of the object (as in crystals, of urinary salts, &c.) produces colors of different *actinic* action; and with a Darker's selenite stage great command may be obtained over the colors desirable for producing the best effects by this mode of arrangement.

CLEANING THE PLATES.—Perfect cleanliness being of the *utmost importance*, when the plates are first received from the glass warehouse they should be immersed in a bath of liquor ammonia and water in equal parts, that all traces of grease may be removed, or, if they have been previously used with iron developing solutions, they should be treated with a bath of two parts nitric acid to one of water, and afterwards *thoroughly* rinsed with pure water. A convenient form of trough for these cleansing operations may be made of gutta percha, the sides being grooved for the reception of each plate separately, so that the liquid may have free access to both surfaces of the plate. To suit plates of different sizes, a moveable grooved slab may be fitted to move across the centre of the trough, so as to advance or recede according to the width of the plates; as soap contains grease it should never be employed. On removing the plates from the water they are wiped with a perfectly clean linen cloth, then laid on a flat metal plate,* and polished off with a silk handkerchief, a circular motion of the hand being used:

* The metallic surface prevents the accumulation of any electricity produced by the friction of the silk, which otherwise would attract floating particles of dust.

they are then put away in the stock box till required. Before coating the plate with collodion it should be finally polished by rubbing it on a doe-skin buff, about ten inches long by four wide, and then dropped into a wooden bowl, to prevent contact with any unclean surface. To preserve the buff from dust it should have a hinged cover, only to be kept open during the operation of polishing. The moment before applying the collodion the surface of the plate should be lightly wiped with a cambric handkerchief to remove any trace of dust.

GLASS PLATES.—The glass plates on which the negatives are taken should be of the best patent plate, about 1-8 inch thick, perfectly free from any irregularity of surface, and cut to fit the pressure-frames best suited to the size of the page to be illustrated, and the edges then ground.

IODIZED COLLODION is a preparation of gun-cotton dissolved in a mixture of anhydrous ether and alcohol, and iodized with pure and white iodide of ammonium, or what is better, as it keeps longer and is more conveniently applied, the iodide of silver and ammonium. By varying the proportion of the alcohol this may be made to produce films of different thicknesses and degrees of tenacity. The greater the quantity the quicker and more even is its action; but, if too much is added, it becomes attenuated, and then cracks and parts from the plate. If the film is to be transferred to paper, blocks or plates, it must be of a very stout quality. The neck of the bottle containing the collodion must always be freed from deposit before pouring any out.

COATING THE PLATE—Bend the forefinger of the left hand into an angle, with the tip pressing on the ball of the thumb; on this rest the corner of the glass plate numbered 1 in the annexed figure, and hold it firmly with the end of the thumb; breathe on the glass to see if it is sufficiently clean and dry; if so, the vapor will pass off instantly, give it the final wipe with the cambric handkerchief, then bringing the glass into a horizontal position, pour the collodion plentifully on to the centre of the plate; incline the plate so that it will flow smooth-

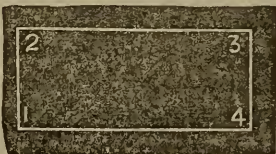
ly and gently into the corner marked 1, avoiding the thumb, then into 2, then 3, and lastly 4 (if the film appears too thin, it may be again flushed up to 2, allowed to spread over the plate, and again returned to 4), when without touching the neck, return the superfluous collodion to the bottle, bring the plate into a vertical position, and impart a tremulous motion to the plate along the direction of its longer axis, so that the ridges formed by draining may run into one another; pass the lip of the bottle along the edge from 1 to 4 and from 4 to 3, backwards and forwards several times till all superfluous liquid is drained off: the result should be a perfectly smooth and even film. When the collodion is sufficiently set, and which can only be judged of from experience, it is ready for exciting.

THE SENSITIVE BATH.—A gutta percha trough 1 inch across, and about the dimensions of the largest plate of your camera, is usually used for the sensitive solution, and should be fixed *obliquely* on a block of wood, not perpendicularly as is generally the case, for this position facilitates the insertion and management of the plate. I, however, prefer the glass trough adapted to the camera, which holds the bath in a position coincident with the focussing glass, as this arrangement certainly facilitates and shortens the operation. In either case a glass dipper may be used, which is simply a strip of glass with another piece cemented across it, on which the plate rests.

The trough is charged nearly full with a bath, which may be prepared according to Mr. Hennah's formula, in the following proportions:

Nitrate of silver,.....40 grains.
Distilled water,.....1 ounce.
Alcohol,.....25 minims.

Separate about an eighth of the quantity prepared, and to the greater bulk add, drop by drop, a solution of iodide of potassium till a precipitate of iodide of silver is formed; agitate, and allow it to stand for some hours till the precipitate is dissolved; filter, and then add the portion previously set aside; test with litmus paper, and if the bath is neutral add nitric acid, in the proportion of two drops to the pint—prepare rather more of this solution



than is absolutely required to fill the trough. When by use this bath is robbed of its proper proportion of nitrate of silver, it may be again restored to its former strength by the judicious addition of a saturated solution of that salt. When not in use, it should be kept in a bottle; if in use, a lid fitted into the mouth of the trough, or the bath-frame of the camera, will preserve it from dust. When the temperature is below 60° Fahr. the bath should be raised to this point by placing it in a water-bath or by warming the room. The operating room, during the process of exciting the collodion film, must be preserved from the admission of white light, and yellow light only employed. The coated plate is rested on the dipper, previously moistened to promote adhesion, and with one steady plunge is passed into the bath. If there is the slightest pause, a line will be produced across the film, which will be imparted into the *positives* printed from it. After remaining in the bath for about a minute it is lifted in and out two or three times, and when the liquid flows evenly over the film it is sufficiently saturated; it is then drained, the uncoated side laid on a pad of blotting-paper to remove superfluous moisture, and finally adjusted in the plateholder, with pieces of blotting paper interposed between the corners of the plates and the glass rests (M, M, M, M, fig. 5). If the glass bath adjusted to the camera is employed, the plate may be coated in the open air; and when the collodion is in a proper condition, the plate, resting against the sloping back of the bath is plunged in, and the lid of the bath-frame shut down; in two minutes raise the lid and push the plate up to the front glass of the trough, so that it occupies a position corresponding with the plane of the focussing glass, and again close the lid, taking care during this movement not to allow any light to fall into the bath, which may be obviated by throwing a black cloth or yellow handkerchief* over this end of the camera.

EXPOSING THE PLATE—if operating in the rooms described, pull up to the required height the blind that shuts off the light from the room containing the object,

and see that there is a sharp image on the focussing glass; then fit the cap on to the lens, replace the focussing glass with the plateholder or bath-frame, raise the shutter of the frame (O, fig. 5), remove the cap of the lens and expose for the necessary time, replace the cap, close the shutter remove the frame, and proceed to develop the picture as soon as possible. The requisite time for exposure can only be judged of by experience, as it depends upon a knowledge of the action of the lens employed, whether single or double combination, the size of the stop, the sensitiveness or age of the collodion, and the nature of the light, color of the object, and the temperature of the atmosphere at the time of operating; but it varies from a moment to a quarter of an hour. With a single achromatic lens of 12 inches focal length, 3 inches diameter, and 1-2 inch stop, from 10 to 30 seconds will be, however, on an average, found sufficient. If a negative is required, it must be exposed longer than for a positive.

DEVELOPING THE NEGATIVE.—On removing the plate in the darkened room no picture will be visible; if it has been exposed long enough for the production of a negative, develop the latent image with the following solution:

Distilled water,.....8 ounces.
Glacial acetic acid,.....4 drams.
Pyro-gallic acid,.....12 grains.

If there is any sediment after the pyro-gallic acid has dissolved, filter and preserve it in a bottle. Place the plate on a stand, having an arrangement of screws by which it may be brought to a level; or the plan I employ saves the expense of this stand—across a glass plate, about 6 inches by 4, I cement a thicker strip about 1 1-2 inch from one end to prevent the liquid flowing up to the fingers and staining them; round the longer end, I fold a piece of stout blotting paper like a note; when this is moistened it acts like a sucker when the plate is laid on it, and may be moved about by the hand without fear of its separating. Having, by either of these means, brought the plate to a horizontal position, pour out, into a perfectly clean glass measure, a quantity of the developing solution sufficient for the size of the plate, and for every dram add 2 drops of a solution of ni-

* A large yellow pocket-handkerchief will be found a very useful companion to a photographer when on a tour.

trate of silver in the proportion of forty grains to 1 ounce of distilled water.

A plate 4 inches by 3 requires 2 drams.

"	5	"	4	"	4	"
"	6	"	5	"	7	"
"	8½	"	6½	"	12	"

Pour this over the surface, and if the plate is held on *the sucker* impart a gentle whirling motion to it, that a perfect dispersion of the liquid may be facilitated. The lights of the picture should appear first, and then the shadows, according to their depth of tone. Examine the progress of the development by reflected light, and when the details of the original are well defined pour off the liquid, and wash in the horizontal position with a stream of cistern water poured gently over its surface. Never retain the solution on the plate after it has attained a dark brown color; and if the plate has been under exposed, which may be known by the picture appearing very slowly, and by the lights deepening before the appearance of the shades, it should be washed off before the whites become opaque. If, on the other hand, both lights and shades appear instantly and about the same moment, with little difference of tint, the plate has been overexposed, and little can be done to make it useful.

DEVELOPING THE POSITIVE.—If a positive is required, the picture should have a shorter exposure in the camera and be developed with the previous solution, to which a few drops of nitric acid has been added.*

FIXING THE PICTURE.—Cover the surface of the plate with a saturated solution of hyposulphite of soda, and by daylight watch the absorption of the iodide of silver, when every trace of this yellow salt has been dissolved, well wash it, and leave a body of water on the surface of the plate for twenty minutes, maintaining it in a horizontal position throughout this operation.† After the plate has been washed several times (for it is important that every trace of the hyposulphite of soda be removed, or it will crystalize and spoil the negative, as it would fade during the ex-

posure when printing from it), it is drained, and, when *perfectly* dry, varnished with amber dissolved in chloroform, which is applied in a similar manner to coating the plate with collodion; the negative is then ready to print from.

MAKING THE PLATES READY FOR PRINTING.

For printing, negative plates are alone employed. The side coated with collodion is laid on the albumenized surface of the positive paper, pressure employed to bring them into close contact, and they are then exposed to the light till the proper depth of color is obtained. The best form of pressure-frame is that sold by Newman, of Regent Street, as the pressure is very equally distributed over the surface, so that there is little danger of breaking the glasses, and is thus constructed: A very flat, strong, well-seasoned board, with a cushion of cotton velvet, padded with layers of flannel, is attached to two strong bars, which again fit into a still stronger bar, as will be readily understood by consulting the back and lateral views (Fig. 14). This cross-bar carries a screw at

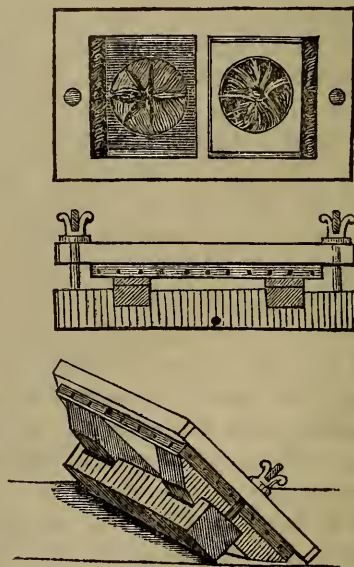


Fig. 14.

each end, over which a frame, fitted with a plate of glass, about 3-8ths of an inch thick, and corresponding with the size of the cushioned board, drops, and which can be screwed down to any required pressure by means of the nuts fitting on to the screws.

* See also Mr. Shadbolt's Paper, Micro Jour., p, 169.

† A levelling stand may be readily formed of a gallipot and wedge of cork, placed in a dish or tray.

In the ordinary way each subject is printed on paper, only a little larger than the size of the picture; afterwards trimmed and mounted on paper; but in the present instance it will be perceived that both views, together with the letterings, are printed on one sheet and by a single operation.

For the purpose of saving time (an important point in the application of photography to the illustration of periodicals or other works) I found it necessary to contrive a special arrangement to attain this end; and experience gained in working this out on the photographs illustrating this journal fully justifies the adoption of this method for the future. In a stout board, 1-2 inch thick, square apertures, in proportion to the size of the page to be illustrated, are cut, just deep enough to admit a piece of plate-glass, 1-4 inch thick, and the negative plate, so that when they are inserted together, the glass is flush with the wood; the thick plate, which is placed undermost, is rather larger than the negative, to allow of two beads fixing it down to the rabbet on which it rests; within the beads the negative plate is cemented by its edges, collodion film uppermost. Above this is cemented the lettering-piece, which consists of a strip of glass, coated and blackened by the albumen or collodion process, and then engraved backwards and varnished; this arrangement will be understood by examining fig. 14.

If the negative plates are too large for the work they are intended to illustrate, as was the case in the present instance, being about 6 inches by 5, the best portion must be selected, the centre of this ascertained, and a circle scratched round it with the sharp point of the compasses; the plate is then cut down with a diamond to the proper sized square. If the object would appear to best effect with a black border, as in the figure of the Tracheæ of the silkworm, the collodion film must be carefully trimmed away with a graver from the margin of the circle, then cleaned off with a cloth moistened with spirit, so as to leave the margin perfectly clear for the passage of light; this consequently prints black; on the other hand, when the subject is dark, as the proboscis of the fly, and would be thrown up with the contrast of a white

ground, a circle must be cut out of black glazed paper, the aperture adjusted to the circle containing the part selected, and the margin gummed down to the collodion side of the plate.

Here I would suggest that if photography is found advantageous for the illustration of microscopical works, authors should adopt a plan similar to that found so convenient with object slides, of using a fixed scale of sizes for their glass plates, which must be determined by the sizes of the books they are intended to illustrate. A demy-octavo, with two negatives to the page, will only allow of the plates being 4 inches square: a demy-quarto will take in four of these plates, or two plates 5 inches square; a square octavo, one of the latter size.

As by this arrangement of the pressure-frame, both the objects and lettering-pieces are printed on the same sheet of paper at the same moment, labor and time, which otherwise would be necessarily employed in mounting them, are saved, consequently expense.

PRINTING THE POSITIVE.

ALBUMENIZED PAPER PROCESS.

The positives, with which the present number of this journal is illustrated, are obtained by the albumenized paper process, which has been selected on account of the brilliancy of the lights, intensity of the shadows, and definition of the pictures it produces.

THE PAPER should have a smooth surface, a firm and even texture, weight from 12 to 24 lbs. per ream, of equal transparency throughout, free from spots of any kind; not too strongly sized,—a starch-sized being preferable to a gelatine-sized paper; as chemically pure as possible, free from watermark, and old paper should be selected in preference to new—the best papers for photographic purposes being those manufactured by Canson Frères, Turner, Whatman, and Lacroix.

The quality of a paper is ascertained by examining it vertically before a light, and the side to be chosen is that which does not show any small square indentations: this, being the smoothest of the surfaces, is selected, and for future recognition, should be marked in pencil with the letter R.

For the albumenized process Canson

Frères' thick paper will be found the best, which should be cut in sizes, about 1-2 inch longer than the length of the picture required.

THE ALBUMEN.—In a large-lipped basin mix the following proportions :—

The white of eggs..... 1 oz.*

Distilled water 1 oz.

Chloride of sodium..... $\frac{1}{2}$ oz.

Whisk this mixture up to a white froth with a wooden or ivory salad fork, or, what is better, a bundle of three or four pens stripped of the feathers; then skim with a wooden or ivory spoon, cover it with a glass plate, and let it stand for twenty-four hours. The scum that is formed on the surface at the end of that time should not be removed, as it protects the rest from dust. Make a small hole in this scum near the lip of the basin, and gently decant a sufficient quantity to cover the bottom of a gutta percha trough to the depth of 1-4 inch. The best troughs that I have seen are those sold by Henneman; they are stamped in moulds, and are attached to slabs formed out of two pieces of well seasoned wood glued together in reverse positions of the grain: this effectually prevents warping, and secures a very flat bottom. As the internal surface is polished, it should never be wiped out with anything but a piece of fine sponge, and when not in use should be kept filled with water. Remove any air-bubbles that may form on the albumen with a piece of paper, then take the paper by corners diagonally opposite, between the tips of the fingers and thumbs; lay one corner on the albumen, bend the paper backwards till it bulges out like a "square sail" before the wind, lower the edge nearest the body gently on the surface, and then, with an even and sweeping motion of the hand, carry forward the marked side of the paper over the surface of the albumen till it floats flat thereon, taking *great* precautions that air-bubbles are not interposed, and that the paper never touches the bottom of the trough, as in either case it would be spoilt; allow the paper to rest for two or three minutes, then with a reverse motion of the hand rip it off the albumen, allow it to drain from a corner, pin it by one corner on to a tape stretched across

the room; in a few minutes make a small piece of blotting-paper adhere to the lowest corner to absorb all moisture that may drain into it; when dry, place it on three or four sheets of blotting-paper, and one sheet on the back; then pass an iron over it so warm that saliva just simmers on it. This coagulates the albumen, forming an insoluble size which renders the paper very tough.

MAKING THE PAPER SENSITIVE.—In the dark room is placed a gutta percha trough, containing a solution* of—

Nitrate of silver..... 120 grains.

Distilled water..... 1 oz

on which the albumenized paper is floated for two or three minutes, and then dried in the same way and with the same precautions as in the former operations. When dry, the papers curl up into cones, like grocers' sugar papers, and in a similar manner may be packed one inside the other, and placed in a tin case till required for use.

If protected from white light, this paper will keep for about a week after its preparation.

EXPOSING IN THE PRESSURE-FRAME.—In the darkened room take the sensitive albumenized paper, spread it out flat, and adjust it on the cushion of the pressure-frame; place the board into which the negatives are fixed over it, see that the coated surface of the plates is in contact with the sensitive side of the paper; screw the two boards tight together, tilt the frame over into such a position that an equal beam of light fall upon the picture; if in the direct rays of the sun, expose for about three minutes; if in diffused light, from half an hour to one hour. The exact time for obtaining the tone required can, however, only be judged of by experience, as the depth of tone of the negatives operated with, and the amount and kind of light during the time of printing, must be taken into consideration. It is, however, better to over than under-print the positives, as the tone can always be reduced, but not increased, by after operations.

* This proportion may be considered extremely strong, but Mr. Henneman finds that it produces vigorous pictures with rapidity. The silver may be reduced to 100, 80, 50 grains, or less, but the chloride of sodium must be reduced in proportion.

* One ounce equals the white of one egg.

FIXING.—The positives must be finally fixed by carefully dissolving out all the remaining chloride of silver they contain by immersing them in a bath of one part of a saturated solution of hyposulphite of soda and eight parts of water. The older this bath becomes the better are the tones obtained; care being taken to add occasionally some fresh crystal of the hyposulphite to prevent its being saturated with the salt of silver obtained from the positive previously treated in it, in which case its dissolving powers cease.

FIXING AND TONING.—Various tones from India paper tints to pure black, may be given to the positives thus obtained, by treating them, after removal from the pressure-frame, with a bath of—

Hypsulphite of soda	1 oz.
Water	7 oz.
Chloride of gold	2 grains

contained in a gutta percha trough, the positive being placed with the picture uppermost. By this method the positive is toned and fixed by the same operation.

Watch the proof till the desired tone has been obtained, the positive should then be removed, and afterwards washed in a succession of baths of warm water till every trace of hyposulphate of soda is removed. These washings usually require about six baths of a quarter of an hour each, and then a final one in distilled water. Too great care cannot be devoted to this operation being thoroughly performed, as otherwise the pictures fade in the course of time.

On removal from the last bath dry the proofs by suspension; when dry, smooth them out by passing a warm iron over the backs, or hot-press them; the warmth also improves the tone of the picture, and glazes it.

Having placed before the reader the various stages of the collodion and albumen process, it will be readily understood what advantages the former offers, for whilst by its aid we can obtain faithful delineations of such an object as the Proboscis of the Fly, from the moment of coating the plate to its final varnishing, in less than a quarter of an hour, and at the cost of a few pence, the same subject engraved on wood, with an equal amount of minuteness, would occupy a wood-engraver a

month, and at a cost of not less than ten pounds. On the other hand, the expense of the employment of silver salts, and the time required in fixing the positives, considerably enhances the cost of printing from them. I trust, however, that photographers will see the necessity of devoting their attention to the perfection of some printing process wherein cheaper sensitive materials can be employed, and probably some of the *chromates* would supply their desideratum: but such rapid and vigorous results have been obtained by the employment of the silver salts, that there has been little inducement to seek perfection by aid of other, though cheaper, agents. As yet the economies of the art have not come fairly before them.

Another cause, tending to make Photographic Printing expensive and inconvenient is the entire dependence of the operator on favorable weather; means should, therefore, be adopted to render him independent of natural light, and little difficulty, would, I think, be experienced in arranging a diffused artificial light suitable for photographic purposes; and the aim should be to produce a bluish violet-colored flame, not an intensely white or yellow one.

It will be seen that the photographer occupies the position of the draftsman, engraver and printer of ordinary processes; but the analogues of drawing and engraving being performed at one and the same moment suggests a division of labor between the photographic artist, who would devote his attention to the artistical principles of the subject and the production of the negatives, and the photographic printer, who would conduct the processes for the production of the positives; and this branch should be conducted on an extensive scale, with division of labor, but this not of an expensive kind, as children or girls might be employed with advantage; and, as mechanical means generally facilitate labor a photographic press, of the following construction might be employed. A flat board with bearded edges, carries two upright supports for the axis of a glass cylinder, covered with a few layers of cloth; this is kept saturated with the sensitive solution by a reservoir attached to one of the uprights, the bottom of which is prolonged into a tube drilled with a row of holes,

from which the liquid flows on to the cylinder according to the amount of atmospheric pressure exerted on its surface, which is governed by the admission of air into the reservoir, by means of a stop-cock attached to its neck. The paper is laid on

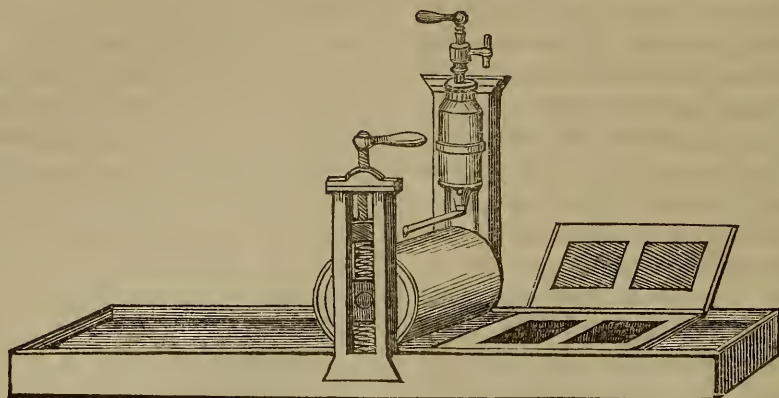


Fig. 15.

a cushion, sliding between the beads of the base board, and a silver plate, with apertures corresponding to the size of the surface to be made sensitive, is brought down on it; it is then passed under the cylinder which has previously been regulated to the proper amount of pressure, by screws affecting the springs on which its axis rests, the paper is then removed, and that part only which is to be acted on will have been made sensitive instead of the whole of its surface, thus preventing the absorption of more liquid than is necessary.

In many instances collodion films may with advantage, be transferred to wood, metal or stone, and thus save the draftsman's labors altogether. When metal plates, however, are to be engraved from photographs, the employment of the *daguerreotype* process would be more advantageous, the practicability of which has already been demonstrated in *Donné* and *Foucault's* "*Cours de Microscopie, com-*

plementaire des Etudes Medicales," published as early as 1846.

In concluding this article, I beg to offer my sincere obligations to Mr. Delves for his liberal and valuable aid in furnishing for this Number of the '*Microscopical Journal*,' the requisite number of negatives from which the positive proofs were produced by Mr. Henneman of Regent Street; also to Mr. A. Ross and Mr. Henneman, for their kindness and readiness in affording me information on lenses and practical photography. And if, in describing the various operations, I have risked appearing diffuse, it is because I am convinced that success in these processes depends upon the minutiae and niceties of the manipulations, but which, however difficult they may appear in type to the uninitiated, after a few trials will come readily to hand, and, with moderate attention, will be rewarded with success.

From Notes and Queries.

PHOTOGRAPHIC NOTES AND QUERIES.

HEAD-RESTS.



THE difficulty I have experienced in getting my children to sit for their portraits in a steady position, with the ordinary head-rests, has led me to design one which I think may serve others as well as myself; and I therefore will describe it as well as I can without diagrams, for the benefit of the readers of "N. & Q."

It is fixed to the ordinary shifting upright piece of wood which in the ordinary rest carries the semicircular brass against which the head rests. It is simply a large oval ring of brass, about an inch and a half broad, and sloping inwards, which of the following size I find fits the back of the head of all persons from young children upwards—five inches in the highest part in front, and about four inches at the back. It must be lined with velvet, or thin vulcanised India rubber, which is much better, repelling grease, and fitting quite close to the ring. This is carried forward by a piece of semicircular brass, like the usual rest, and fixes with a screw as usual. About half the height of the ring is a steel clip at each side, like those on spectacles, but much stronger, about half an inch broad, which moving on a screw or rivet, after the sitter's head is placed in the ring, are drawn down, so as to clip the head just above the ears. A diagram would explain the whole, which has, at any rate, simplicity in its favor. I find it admirable. Ladies' hair passing through the ring does not prevent steadiness, and with children the steel clips are perfect. I shall be happy to send a rough diagram to any one, manufacturers or amateurs.*

J. L. Sisson.

Edingthorpe Rectory.

SIR W. NEWTON'S EXPLANATIONS OF HIS PROCESS.

In reply to Mr. JOHN STEWART'S Queries, I beg to state,

First, That I have hitherto used a paper made by Whatman in 1847, of which I have a large quantity; it is not, however, to be procured now, so that I do not know what paper to recommend; but I get a very good paper at Wooley's, Holborn, opposite to Southampton Street, for two shillings a quire, and, indeed, it might do for negatives.

Secondly, I prefer making the iodide of silver in the way which I have described.

Thirdly, Soft water is better for washing the iodized paper; if, however, spring water may be made use of, *warm* should be added, to raise it to a temperature of sixty degrees. I think that sulphate or bicarbonate of lime would be injurious, but I cannot speak with any certainty in this respect, or to muriate of soda.

Fourthly, The iodized paper should keep good for a year or longer; but it is always safer not to make more than is likely to be used during the season.

Fifthly, If I am going out for a day, I generally excite the paper either the last thing the night before, or early the following morning, and develop them the same night; but with care the paper will keep two or three days (if the weather is not hot) before exposure, but of course it is always better to use it the same day.

WM. J. NEWTON.

6 Argyle Street.

TALC FOR COLLODION PICTURES.

Should any of your photographic friends wish to transmit collodion pictures through the post, I would suggest that thin plates of talc be used instead of glass for supporting the film; I find that substance well suited to the purpose. One of the many advantages of its use (though I fear not to be appreciated by your achaeological

* The Messrs. Lewis of this city, constructed a rest of this kind more than three years ago.—*Ed. Phot. Art-Jour.*

and antiquarian section) is, that portraits, &c., taken upon tale can be cut to any shape with the greatest ease, shall I say suitable for a locket or brooch? W. P.

Headingley, Leeds.

PHOTOGRAPHIC NOTES.

G. H. P. has communicated (Vol. vii, p. 186,) a very excellent paper in reference to our numerous failures in the collodion process; but the remedies he proposes are not, as he is aware, infallible. He gives the recommendation you find in every work on the subject, viz. to lift the plate up and down in the bath to allow evaporation of either. I have made experiments day after day to ascertain the value of this advice, and I am convinced, as far as my practice goes, that you gain nothing by it; indeed, I am sure that I much oftener get a more even film when the plate is left in the bath for about two minutes without lifting it out. I should be glad of other photographers opinion on the point.

I have never found any benefit, but much the contrary, from re-dipping the plate in the bath; and I may observe, the same of mixing a drop or two of silver solution with the developing fluid.

I think with G. H. P. that the developing solution should be weak for positives.

I omitted, in my description of a new head-rest, to say that it is better to have all the parts in metal; and that the hole, through which the arm runs, should be a square mortice instead of a round one, as is usual. A screw at the side sets it fast; the lower portion of the upright piece being round, and sliding up and down in a tube of metal, as it does in the best rests, allowing the sitter to be placed in different positions. All this is very difficult to describe, but a slight diagram would explain it easily, which I would willingly, as I have before said, send to any one thinking it worth writing to me for.

Edingthorpe Rectory. J. L. Sisson.

ON SOME DIFFICULTIES IN PHOTOGRAPHIC PRACTICE.

Being desirous to have a glass bath for the silver, I was glad to find you had given (in "Notices to Correspondents") directions for making one, viz. two parts best

red sealing-wax to one part of Jeffries' marine glue. I tried this, but found the application of it to the glass impossible, as it set immediately. Now, can you afford room for the means by which this may be remedied; as my wish to substitute glass for gutta percha remains?

Now I am addressing you, may I offer one or two hints which may be of service to beginners? If, after what has been considered sufficient washing of the glass, after the hypo., during the drying, crystals from hypo. remaining appear, and which would most certainly destroy the picture, I have found that by *breathing well* over these parts, and immediately repeating the washing, all ill effects are thoroughly prevented. To substitute hot water instead of breathing does not destroy the hyposulphite, and therefore will not do.

When the plate shall be dry after the washing process, if a lead, dim, grey appearance occurs, I have found that by tenderly rubbing it with fine cotton, and applying with a good sized camel's hair pencil a varnish of about 8-10ths spirits of turpentine, and 2-10ths mastic varnish, and then, before this gets dry, putting on the black varnish, the grey effect will have been removed.

I have found the protonitrate of iron, as also the protosulphate, and not seldom the pyrogallic, so difficult of application, that I have stained and spoiled very good pictures. I have therefore used, and with perfect success, a tray of gutta percha a little longer than the glass, say one-fourth of an inch, and one-fourth of an inch deep; sliding from one end the glass into the tray (supplied immediately before using it by which means the glass is all covered at once.

I think the Rev. Mr. Sisson's suggestion, viz. to send you some of our specimens with collodion, a very proper one, if not declined on your own part, and shall, for one, feel great pleasure in acting in accordance with it.

You will, I trust, pardon my foregoing hints for beginners, as I well know that I have lost several pictures by hypo-crystals, and very many by the difficulty in developing.

L. MERRITT.

Maidstone.

P. S.—I always find collodion by Dr. DIAMOND's formula capital, and with it from five to ten seconds is time enough.

MR. WELD TAYLOR'S CHEAP IODIZING PROCESS.

I have no doubt Mr. WELD TAYLOR will be kind enough to explain to me two difficulties I find in his cheap iodizing process for paper.

In the first place, whence arises the caustic condition of his solution, unless it be through the decomposition of the cyanide of potassium which is sometimes added? and if such a caustic condition exists, does it not cause a deposition of oxide of silver together with the iodide, thereby embrowning the paper?

Why does the caustic condition of the solution require a larger dose of nitrate of silver, and does not this large quantity of nitrate of silver more than outbalance the difference between the new process and the old, as regards price? I pay 1s. 3d. for an ounce of iodide of potassium of poorest quality; the commoner commercial quality is cheaper.

F. MAXWELL LYTE.

COLORING COLLODION PORTRAITS.

I shall be obliged if any brother photographer will kindly inform me, through the medium of "N. & Q." the best method of coloring collodion portraits and views in a style similar to the hyalotypes shown at the Great Exhibition.

We country photographers are much indebted to Dr. DIAMOND for the valuable information we have obtained through his excellent papers in "N. & Q.," and perceiving he is shortly about to give us the benefit of his experience in a compact form under the modest title of *Photographic Notes*, I suggest that, if one of his Notes should contain the best method of coloring collodion proofs, so as to render them applicable for dissolving views, &c., he will be conferring a benefit on many of your subscribers; and as one of your oldest, allow me to subscribe myself PHOTO.

ON SOME POINTS IN THE COLLODION PROCESS.

In your impression of this day's date (Vol. vii., p. 363.), the Rev. J. L. Sisson desires the opinion of other photo-

graphers relative to lifting the plate with the film of collodion up and down several times in the bath of nit. silv. solution; and as my experience on this point is diametrically opposed to his own, I venture to state it with the view of eliciting a discussion.

The *evenness* of the film is not at all dependent upon this practice; but its sensibility to light appears to be considerably increased.

The plate, after being plunged in should be allowed to repose quietly from twenty to thirty minutes, *and then rapidly* slid in and out several times, until the liquid flows off in one continuous and even *sheet* of liquid; and this also has a beneficial effect in washing off any little particles of collodion, dust, oxide, or any foreign matter which, if adherent, would form centres of chemical action, and cause spottiness in the negative.

I find that the plate is more sensitive also, if not exposed before all the exciting fluid that can be *drained off* is got rid of; that is, while still quite moist, but without any *flowing* liquid.

As to redipping the plate before development, it is, I believe, *in general* useless; but when the plate has got *very* dry it may be dipped again, but should be then *well drained* before the developing solution is applied.

Mr. F. Maxwell Lyte (p. 364) quotes the price of the purest iodide of potassium at 1s. 3d. per oz. I should be glad to know where it can be obtained, as I find the price constantly varies, and upon the last occasion I paid 4s. per oz., and I think never less than 1s. 8d.

Mr. L. Merritt will probably succeed in applying the cement for a glass thus:—Place the pieces of glass upon wood of any kind in an oven with the door open until he can only just handle them: then, with a roll of the cement, melting the end in the flame of a spirit lamp, apply it as if for sealing a letter. This should be done as quickly as possible. The glasses may then be passed over the flame of the lamp (in contact with it,) so as to raise the temperature, until the cement is quite soft and nearly boiling (this can be done without heating the parts near the fingers); and while hot the two separate pieces should be applied by putting one down on a piece of wood covered with flannel, and pressing

the other with any wooden instrument: metal in contact would cause an instantaneous fracture.

Mr. Merritt's difficulty with the developing solutions depends most probably in the case of the pyrogallic acid mixture not having enough acetic acid. The protonitrate of iron, if made according to Dr. Diamond's formula, does *not* require any acetic acid, and flows quite readily; but the protosulphate solution requires a bath, and the same solution may be used over and over again.

GEO. SHADBOLT.

London, April 9, 1853.

ECONOMICAL IODIZING PROCESS.

MR. MAXWELL LYTE is probably as good a judge as myself, as to where any weak point or difficulty is found in iodizing paper with the carbonate of potash: if any chemical is likely to be the cause of unusual activity, it is the carbonic acid, and not the cyanide of potash. I still continue to use that formula, and have not iodized paper with any other: though I have made some variations which may perhaps be of use. I found that the nitrate of potash is almost the same in its effects as the carbonate. I would as soon use the one as the other; but the state I conceive to be the most effective, is the diluted liquor potassæ: that would be with iodine about the same state as the iodide of potash, but hitherto I have not tried it, though I mean to do so.

I am not quite certain as to whether, theoretically, this position is right; but I find in iodide of potash, and in the above formula, that the iodine is absorbed in greater quantities by the silver, than the alkaline potash by the nitric acid. Thus, by using a solution for some time, it will at last contain but very little iodine at all, and not enough for the purpose of the photographer; hence it requires renewing. And I have lately observed that paper is much more effective, in every way, if it is floated on free iodine twice before it is used in the camera, viz. once when it is made, and again when it is dry: the last time containing a little bromine water and glacial acetic acid. It appears to me that the paper will absorb its proper dose of iodine better when dry, and the glacial acetic acid will set free any small amount of alkaline potash there may be on the surface; so

that it will not embrown on applying gallic acid. By using the ammonio-nitrate of silver in iodizing, and proceeding as above, I find it all I can wish as far as regards the power of my camera. With this paper I can use an aperture of half an inch diameter, and take anything in the shade and open air in five or six minutes, in the sun in less time. The yellow color also comes off better in the hyposulphite.

I think Mr. Maxwell Lyte has made a mistake as to the price he quotes; about here I cannot get any iodide of potash under 2s. per ounce, and the five grains to the ounce added to the common dose of nitrate of silver is hardly worth speaking of; it would amount, in fact, to about fifteen grains in a quire of Whatman's paper, no great hardship, because many use much higher doses of silver for iodizing; forty grains to the ounce is not uncommonly used, but I believe twenty-five grains quite enough.

I presume, in Sir Wm. Newton's mode of treating positives, the acid of the alum decomposes the alkali of the hypo. sulph. And it would be, I suppose, better for the picture, if its state were entirely neutral when put away or framed; but if alum is added, acid must remain, since Sir Wm. says it combines with the size. What I should imagine is, that the idea is good; but experience can only decide if the picture is better put away in an acid condition. I should think there are more available acids for the purpose, for alum has an injurious effect upon color; and a positive is nothing but color, the organic matter of the paper stained as it were by the silver: for, after all its washings and application of reagents, no silver can possibly remain in the paper. The safest state therefore of putting away ought to be ascertained and decided upon; as it is no use doing them if they fade or even lose their tones.

WELD TAYLOR.

N. B.—The iodized ammonio-nitrate paper will not bear exposure to the sun; it will keep any length of time, but should be kept in a paper, and away from any considerable degree of light.

PHOTOGRAPHIC COLLODION (VOL. VII., P. 314.)

In a former communication I pointed out the wide differences in the various manipulations prescribed for making the photogra-

phic gun cotton by several persons of small leisure, and who are likely to lose half the opportunities of a photographic season, whilst puzzling over these diversities of proceeding. Suffer me now to entreat some one to whom all may look up (perhaps your kind and experienced correspondent Dr. Diamond will do this service, so valuable to young photographers) to clear up the differences I will now "make a note of," viz., as to the amount of dry photographic gun cotton to be used in forming the prepared collodion.

On comparing various authors, and reducing their directions to a standard of *one ounce of ether*, I find the following differences: viz., Dr. Diamond (Vol. vi., p. 277.) prescribes *about* three grains of gun cotton; Mr. Hennah (*Directions, &c.*, p. 5.) about seven grains; the Count de Montizon (*Journ. of Phot.*, p. 23.) eight grains; whilst Mr. Bingham (*Supplement to Phot. Manip.*, p. 2.) directs about *thirty-four* grains! in each case to a single ounce of ether.

These differences are too wide to come within even Mr. Archer's "long range," that "the proportions . . . must depend entirely upon the strength and thickness required . . . the skill of the operator and the season of the year." (Archer's *Manual*, p. 17.)

COKELY.

FILTERING COLLODION.

Count de Montizon, in his valuable paper on the collodion process, published in the second number of the *Journal of the Photographic Society*, objects to filtration on the ground that the silver solution is often injured by impurities contained in the paper. It may be worth while to state, that lime, and other impurities, may be removed by soaking the filter for a day or two, before it is used, in water acidulated with nitric acid; after which it should be washed with hot water and dried.

T. D. EATON.

PHOTOGRAPHIC NOTES (VOL. VII., P. 363)

I wish to correct an error in my communication in "N. & Q." of April 9: in speaking of "a more *even* film," I meant a film more *evenly* sensitive. I am sorry I have misled Mr. Shadbolt as to my meaning. I have very rarely any "spottings" in my pictures; but I always drop

the plates once or twice into the bath, after the two minutes' immersion, to wash off any loose particles. I also drain off all I can of the nitrate of silver solution before placing the glass in the camera, and for three reasons:—1. Because it saves material: 2. Because the lower part of dark frame is kept free from liquid; 3. Because a "flowing sheet" of liquid must interfere somewhat with the passage of light to the film, and consequently with the sharpness of the picture. I think it is clear, from Mr. Shadbolt's directions to Mr. Merritt, that it is no very easy thing to cement a glass bath with marine glue.

J. L. SISSON.

COLORING COLLODION PICTURES (VOL. VII., P. 338.)

In your impression of April 16, there is a typographical error of some importance relative to lifting the collodion in and out of the bath: "The plate, after being plunged in, should be allowed to repose quietly from twenty to thirty *minutes*," &c. This should be *seconds*. The error arose, in all probability, from my having used the contractions 20" to 30."

It may appear somewhat droll for any one to answer a question on which he has *not* had experience; but I beg to offer as a *suggestion* to PHOTO, that if he wishes to use collodion pictures for the purpose of dissolving views, he should first copy them in the camera as transparent objects so as to *reverse* the light and shade, then varnish them with Diamond's solution of amber in chloroform, when they will bear the application of transparent colors ground in varnish, such as are for painting magic-lantern slides.

GEO. SHADBOLT.

GUTTA PERCHA BATHS (VOL., VII. P. 314.)

In "N. & Q." for March 26, I ventured to recommend to H. Henderson gutta percha, as a material for nitrate of silver baths. I did this from a knowledge that hundreds of them were in use, but chiefly because I have found them answer so well. In the same number the Editor gives Mr. Henderson very opposite advice; and, had I seen his opinion before my notes appeared, I should certainly have kept them back. But it is, I think, a matter of some importance, especially to beginners, to have it settled, whether gutta percha has the effect

of causing "unpleasant markings" in collodion pictures or not. With all due deference to the Editor's opinion, I do not believe that gutta percha baths are injurious to the finished picture. I have never any markings in my glass positives now, but what may be traced with certainty to some unevenness in the film or dirtiness on the glass. And I hope that the number of beginners who are using gutta percha baths, and who are troubled with these unpleasant markings (as all beginners are, whether they use glass or gutta percha,) will not, without some very careful experiments, lay the fault upon the gutta percha. In the number for April 2, the Editor thanks me for what he is pleased to call "the very beautiful specimen of *my skill*." This was a small glass positive, which I sent him in accordance with an offer of mine in a former note. Now, *that* was rendered sensitive in a gutta percha bath, which I have had in use for months; and I think I may appeal to the Editor as to the absence of all unpleasant markings in it. Probably it may be a good plan for those who make the baths for themselves to adopt the following simple method of cleaning them at first. Fill the bath with water, changing it every day for a week or so. Then wash it with strong nitric acid, and wash once or twice afterwards. Always keep the nitrate of silver solution in the bath, with a cover over it. Never filter, unless there is a great deal of extraneous matter at the bottom. If glass baths are used, cemented together with sealing-wax, &c., I imagine they might be as objectionable as gutta percha. The number of inquiries for a diagram of my head-rest, &c., from all parts of the kingdom—Glasgow, Paisley, Manchester, Leicester, Leeds, Newcastle, Durham, &c. &c.—proves the very large number of photographic subscribers "N. & Q." possess. I think, therefore, it cannot but prove useful to discuss in its pages the question of the advantage or disadvantage of gutta percha.

J. L. Sisson.

Edinthorpe Rectory, North Walsham.

GLASS BATHS.

Several of your correspondents finding a difficulty in making glass baths, I beg to communicate the way in which they may be

very easily manufactured. Having obtained two pieces of patent plate glass, grind the edges, which may readily be done by a scythe sand-stone, where other contrivances are not handy. Cut for the bottom of the bath a slip of the same glass three quarters of an inch in breadth; and for the sides, from ordinary window glass, four wedges, being about three-fifths of an inch at one end, tapering down to the thickness of the piece of plate glass at the bottom. If several pieces are cut off promiscuously, four may be selected which have exactly the same angle, so as to form an even support to the sides. The glass being perfectly clean dry, and as warm as can be conveniently held by the hand, fix the bottom and then the sides by means of the *very best* sealing wax, which will perfectly adhere to the glass. If the commoner sorts of wax are used, some marine glue must be added to it to temper it. The side slips should be fixed a quarter of an inch apart, so as to form a cavity, which must be entirely filled up with wax. The wax may be used as in sealing a letter in the first instance; but in order to give the whole bath solidity, and expel every particle of air from between the glass, I use a heated pointed iron, as a plumber does in the act of soldering. This, passed over the external parts of the wax, also gives it a hardness and smooth finish.

These details may appear trifling, and others may have more ingenious modes of accomplishing the object; but having used baths so constructed upwards of twelve months without leakage, I believe they will be found to be most economical, and far more to be relied on than gutta percha. A good bath so made should require about six ounces of solution of nitrate of silver to take a picture eight inches square. Your observations in a former number respecting the uncertainty of gutta percha, I have found to be perfectly true. Samples of gutta percha constantly vary: and one may contain impurities acted upon by the chemicals, which another does not. A small rim formed by sealing wax dissolved in spirits of wine, and applied twice or thrice along the upper edge of the bath, is sufficient to protect the prepared glass from adhering to the front of the bath when in use.

H. W. D.

SECURING CALOTYPE NEGATIVES.

Will any of your correspondents be good enough to say what they consider the best method of securing a calotype paper negative for a few days or a week, in cases where it may be difficult, from lack of conveniences during that time, to use hyposulph., with its consequent washings,

&c. ? Some, I believe, recommend bromide of potassium; some, the iodide; others, common salt: but I should like to know which is considered the *best*; what strength, and how applied. Also, whether any subsequent treatment is necessary previous to the final application of the hypo.
W. T.

From the New York Tribune.

THE EXHIBITION AT THE CRYSTAL PALACE.

SCULPTURE.



THE Crystal Palace was not crowded yesterday, but there were quite as many people within it as was convenient for the workmen engaged in opening boxes and arranging their contents on the counters and shelves of the still vacant courts. Most of the visitors we judged to be strangers in the City—persons who had come here to witness the show and could not stay for its more perfect days that are to come hereafter. Among them were very many ladies, but comparatively few children, who will by and by form a large proportion of the crowd that will daily throng the Palace, and who will derive the highest pleasure and utility from its gorgeous instructive displays. The whole number of visitors during the day, as we ascertained last evening at the Company's Office, was over 7,000, besides exhibitors and holders of season tickets; there were sold, during the day, 3,450 tickets, producing \$1,639 50. In a few weeks, when the scene has expanded into its full beauty, we may expect to see this attendance more than quadrupled.

Not too much can be said in praise of the excellent order maintained within the building and around its entrances without. We saw there yesterday nothing to indicate either disturbance on the part of the people,

or officious interference on the part of the Police. All was civility, safety, quiet, and kindness. The neat uniforms of the Police no doubt contribute somewhat to this result. It seemed to demonstrate one policeman in uniform to be worth half a dozen in plain clothes. But very much of this admirable good order is to be attributed to the native influence of beauty on the mind. In that scene anything like disorder would be instinctively repelled as if it were the profanation of a sacred place, and even those who might be turbulent elsewhere, must here be hushed into peace and good manners.

The Exhibition visibly advances toward completion, and yesterday it was better worth seeing than at the Inauguration. The Departments wearing the air of most complete arrangement are the Italian, and the Dutch, and that of American cloths, prints, tools, fancy articles, and farmers' implements. The French, English, and German Departments still show a great extent of space altogether unoccupied, though of the three the English seems to be most advanced. The show of machinery and metals is still exceedingly imperfect, and we suppose must remain so till the additional building between the Palace and the Reservoir is completed. The collection of agricultural implements is, however, already considerable, beautiful and most interesting. But even this is too incom-

plete to allow of valuable description and comparative criticism, and indeed the same may be said of almost every portion of the entire show. There is scarcely a branch of industrial or natural production which is here represented in sufficient detail to be profitably or even fairly discussed.

But this cannot be said of the Fine Arts, and especially of the department of Sculpture, of which the Palace has many specimens. The gallery of paintings will, we believe, be very full, though that too, waits for the additional building, and meanwhile those pictures which are exhibited are hung diffusely in the courts appropriated to the nations from which they come, and for this reason we do not propose to speak of them until all are assembled together, and may be seen by the public in one continuous survey. The pieces of sculpture, however, may be seen now in their permanent places, and on that account we begin with them as forming the most complete portion, as they certainly do one of the most attractive, in the Exhibition.

First, then, let us observe, that there is no sphere of art in which the public is so much imposed on, and, if we may say it, so extremely humbugged, as in sculpture. The reason is palpable. Sculpture brings before us forms without color, a thing unknown to nature. It deals only with outlines and surfaces, having abstracted therefrom the mass of qualities that the common eye beholds in external objects. Consequently the common eye is unable to judge of its excellence. The mass of people when placed before a statue are about as incompetent to estimate and feel its worth or its defects, as a blind man would be to decide about the correctness of a model of the Parthenon or of Mount Blanc. They have not observed and studied nature in that aspect, and accordingly cannot tell whether its representation is faithful and artistic or the contrary. But they know that the work before them is sculpture; that it was carved by the illustrious Mr. Thing, or the famous Baron Thung, and so they go into raptures about it. They are dead humbugged, and think they enjoy themselves in proportion.

A striking illustration of the truth of these remarks may be had by whomsoever will take the trouble to stand for a little while near Baron Marochetti's equestrian

statue of Washington, which is in the place of honor under the dome of the Palace. It is bad unqualifiedly and entirely, it is beneath mediocrity, and yet it seems to be a source of pleasure to many humbugged people. We are told that the same horse was employed by the artist to mount the effigy of Richard Cœur de Lion, which he exhibited at the London World's Fair and which was so much admired that a movement has been set on foot to erect it in Hyde Park as a public monument of that Exhibition, which movement, by the way, will fall through under the vigorous opposition of the London Press. But this proves nothing more than that the admirers of Marochetti in England are as easily deluded as those in this country. For, though we never saw that statue, we dare pronounce it intolerable. No group of which such a horse forms a part, could be worthy of any criticism except to explode its pretensions. It is an ungainly, wooden, lifeless, and ill-proportioned animal. Its action would be impossible in a real horse. The fore foot is lifted as if to paw the ground with violence, while the raised hind foot is going upon a gentle trot. But this colossal abortion is nothing to the figure astride of it. The attitude of this figure is about that which would be assumed by a bag of meal on horseback. The body is short and squat and the legs long, while the head is out of proportion with either. The face has not the least resemblance to that of Washington, and looks more like Franklin than any other of the American revolutionary patriots, though we should hate to believe it a likeness of any. The head is bare; and the right hand, resting on the thigh, holds the three-cornered hat. This hand is twisted in a manner which suggests the idea of palsy or some other preternatural flexibility of the muscles. The palm is turned outward, and the fingers are quite out of proportion. In short we are unable to find in this colossal work a single point worthy to be admired or even tolerated, and if the artist enjoys, as we are told he does, a European reputation, it must be among a very limited circle.

But if we are obliged thus to speak of this statue, what shall be said of the image behind it, called by the name of Webster? This is certified to be the production of Mr. Carew, an English sculptor, whose name

had been heard on this side of the Atlantic, though his works had never been seen here. Absolutely this statue is a disgrace to its maker, and an outrage on the memory of its subject. We have used pretty severe language on the Washington, but it is a genuine work of art compared with the Webster. We do not believe there is in town a wood carver, who cuts figure-heads for ships, who would not lose all his customers if he supplied them with such work as this. The head is deformed, the forehead bulges as with hydrocephalus, the features are feeble and expressionless, the body, the arms, the legs, the draperies, the pose, the action—all are not only without merit, but so far replete with its opposite as to be beneath contempt. Indeed, it is a pity that the thing stands in the Exhibition.

From these two unfortunate productions we turn with satisfaction to the Amazon by Kiss, which has its place near them, as if to render their want of every artistic quality only the more salient. This is a work of undeniable ability, which has achieved a good reputation for its author. The original stands in the open air by the door of the Museum at Berlin, and has long been an object of admiration in Germany. At London, too, it received the medal given to the best piece of sculpture in the Exhibition. The subject has great capabilities. A young Amazon on horseback, armed with a spear, is surprised by a tiger leaping upon the breast and neck of her horse and fixing his claws and teeth in the flesh of the frightened and suffering animal. Undaunted, she levels her spear at the tiger, and her face and movement indicate a courage superior to his ferocity. It is a conception full of the elements of life and interest. The beautiful woman, whose costume and movement reveal at once the vigor and the grace of her form, the wounded and desperate horse, the tiger clinging madly to his prey, and the bold heart and firm hand of the rider, all powerfully appeal to the feelings of the beholder. There is also great merit in the execution: Contrast this living and well-shaped horse with that deformed one by Marochetti and you will easily get too high an idea of the work of Kiss. Certainly it is far superior to the mediocrity that prevails in the mass of recent sculptures. There is in it the

evidence of power, knowledge, and sense on the part of the artist. It deserves to be admired. But we do not pronounce it faultless. There is a serious defect in it as a composition. For instance, if you stand directly in front of the group, you will be unable to form an idea what it represents. The back of the tiger is so curved by the animal's posture on the chest of the horse, that you cannot tell that it is a tiger, and at the same time it hides from you both the Amazon and the horse, with the exception of the head of the latter, which however is turned aside so that you are not sure that it belongs to the same body to which the tiger is hanging. Now, it will not do to say that it is not necessary that this front view should be perfect, because the group stands in Berlin with that view directly presented to the public, and it should therefore have been composed so as to make that view a good one, if not the best of all. On the whole it is an interesting and pleasing work, but by no means a first-rate one.

Not far from this, in the South Nave, is Müller's group of the Minstrel's Curse. Mr. Müller is a young German sculptor trained in the best schools of Europe, who has come to establish himself in this country, bringing with him this group as an evidence of his capacities. We fear that his talents have not been recognized here at their true value, for we see in the Exhibition nothing else from his severe and vigorous chisel. Nor are the charms of elegance and beauty lacking to him. In this group, the boy, fainting in the languor of death, droops with touching grace to the earth, while the father, standing upright, raises his right hand to launch the imprecation at the tyrant who has slain his son. The story is told in one of the beautiful ballads of Uhland, and the sculptor has admirably caught its spirit. The figure of the father is full of dignity and strength, and his face is inspired with the just rage natural to one who has lost so much by such a crime. This group is not yet placed upon a permanent pedestal, and does not stand high enough to be seen to the best advantage. It is an ornament to the Exhibition, and will carry the fame of its author over the United States.

In the North Nave is a bronze figure by Mr. H. K. Brown, apparently designed for a monument. If we mistake not, it is

essentially the same statue as we saw last year by Mr. Brown, called the Angel of the Resurrection. At any rate the two have a family likeness, though this one has no wings, while the other was well furnished in that respect. It is a female figure, draped to the feet, with the right hand raised and pointing up, and the left suspended and pointing down. It has little meaning and no beauty. By the way, why will Mr. Brown provide his statues with such big feet? The draperies are very commonplace and insignificant.

Not far off is the great attraction among the sculptures of the Palace. We refer to Thorwaldsen's Christ and Apostles. They are all large, but the Christ is colossal. These figures were designed to ornament a church, and can be perfectly appreciated only in combination with architecture. The Christ, for instance, should stand so far from the others as to reduce the excessive difference in their size, but here the want of space necessitates crowding them together. And so of every one of the thirteen statues; each can be properly judged only in connection with the objects and uses for which it was made. But they all betray the hand of a master. Thorwaldsen was not a great original genius. He is not to be classed with the first sculptors of history, with such men as made the Venus of Milo or the frieze of the Parthenon. Among modern sculptors he has superiors in some respects. He could not have made Houdon's Voltaire, or some of the busts of Powers. But he was a man of broad, powerful, generous nature, and of exhaustless fertility. He could grasp and combine a complicated work and take hold of it with mastery and ease. What a life of happy activity was his; what a crowd of productions he left behind him, ranging through almost every sphere of his art, marked generally by the freshness of a broad and untiring imagination, and executed in a large facile manner. He was rich in resources, and his mind and hand were fraught with erudition. There is much learning in these thirteen figures. Take the draperies for instance, and see how artistically rich and graceful hang their folds. These details illustrate the superiority of the accomplished artist. If you would know their value, turn from Thorwaldsen

to Brown, and contrast the draperies of the Apostles with those of the bronze figure above referred to. In point of expression we find these statues not inadequate to their subjects and their purpose. The general treatment must of necessity be somewhat conventional and based upon the traditions and sentiments of the religious world. An entirely new conception of the Savior and his followers would have been unsuited to the purpose for which the group was made. Within these limits, then, lay the problem to be solved by the artist, and his work, if it does not attain to ideal perfection, is worthy of his fame. If not a great and faultless work, it is one of eminent merits, and we predict will continue to be the most generally admired feature of the Exhibition.

A considerable number of Italian statues are exhibited, mostly in marble, but they are uniformly very poor. Italy is now not rich in either sculpture or painting, and has by no means sent here specimens of her best. In industry she has beautiful products in the Exhibition, but in art we cannot boast for her. One statue, however, has a pleasing character: it is of a child threading a needle, and the intent expression of the face makes it prominent among the dreary blankness of its neighbors. We did not learn the name of the artist.

But these large marble and bronze statues must yield the palm of perfection to some animals and birds in bronze in the French department. In this line, excellence here seems to reach its boundary. There is a heron trying to extract an arrow which has pierced its body, by Comolera, which we do not think could be improved either in vivid truth to nature, or in the details of execution. There are partridges, wolves and other animals by Delabrierra, which, though of less magnitude and pretension, are remarkable for beauty and artistic finish of work. It is perhaps not singular that in these small and comparatively easy subjects such excellence should be reached, while the nobler horse is so rarely modeled with truth and life, and the still nobler creature, man, rarest of all. It was not so in the palmy days of Greek art. The horses on the Parthenon are beautiful, but the human figures are more

so. Then the artist seemed to gain in power as his subject rose ; now it is the reverse.

We cannot properly close our notice of the statuary in the Crystal Palace without reference to the Equestrian Jackson, by Clark and Mills, which, though not exhibited beneath its roof, is exhibited in the neighborhood, and with reference to the crowds attracted there. This work has been excessively and ignorantly praised, and will stand as a monument of the absurdity of trying to do what you don't understand. It has two points on which it has been lauded : one is that it was made by a young man who knew nothing of sculpture but what he taught himself, and the other is that it stands unpropped on its hind legs. Both are foolish, but the first is preposterous. You might as well expect a young man with an ear for music, but no instruction, to compose an opera like Don Juan, or an unlearned carpenter to build an edifice like St. Peter's, as to expect a good equestrian statue from a tyro, though he had a genius like Michael Angelo's. Such a statue requires all the discipline, all the learning, all the resources of the art, of which it is one of the most difficult productions. Why, a man is not trusted to make a watch, or forge a horse-shoe till he has gone through an apprenticeship ; and yet we are told that he can accomplish a work infinitely more difficult without any apprenticeship at all ! This is the summit of nonsense, and merited the endorsement of the last Congress with a premium of \$20,000. But let us look at the statue which has thus been rewarded. Here we are met by the second point of excellence, the rearing of the horse on his hind legs without any prop to hold him up, such as is employed in other equestrian statues where the horse is represented in that position. Now this is not an artistic but a mechanical point, and might have been gained by any former artist who had enough ignorance, or want of conscience enough. There is no difficulty whatever in standing such a statue on the hind legs, and never was any difficulty, if artists

would have adopted the manner of Mr. Mills. His secret consist in substituting for the legs of a horse those of a gigantic ox or a moderately sized elephant. On supports like those a world might stand alone, without any special glory to the builder ; indeed, if he boasted of it as a beauty, it would rather turn to his shame.

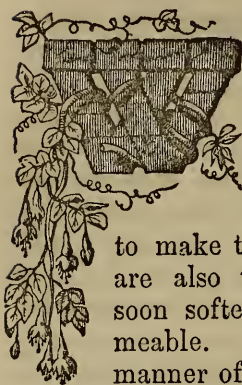
In the Jackson, this disproportion of the horse's hind legs and quarters is excessive ; seen from the rear or the front, it becomes a deformity which would be glaring were there any beauty in the work with which to contrast it. The equipoise of the statue is, no doubt, also maintained by casting the rear parts much heavier than the front. The figure of the rider is mainly back of the apparent center of gravity, and does its part in keeping all straight. It is a stiff, awkward, graceless, and undignified figure. Nothing could well be less pleasing than the angular, elbow-crooked sort of way in which the right hand holds the military hat. But we cannot go over the work in detail. Nor does it need such criticism. It speaks for itself. It is the work of a novice. It is not a work of art. It knows nothing of art. It has no artistic features. It is, no doubt, an ingenious production for a young man under such circumstances, but it is most unfit for Congress to pay for, or to be set up as national monument. Still, if it is any consolation, we will add that it is not so poor as Marochetti's Washington.

We state these plain truths with sorrow, but they need to be stated, not only for the sake of Mr. Mills, but for the sake of the country. It is a national misfortune for an American to produce a work so beneath criticism, at a large expense to the National Treasury. It is a personal misfortune when it is grossly and falsely praised, for such delusion cannot last, and the waking up from it is intensely painful. Mr. Mills has a contract to make a statue of Washington. We earnestly counsel him to doubt his own powers ; to begin the modest and difficult career which alone can elevate even a man of genius into an Artist ; and to qualify himself for so arduous a work before he undertakes its execution.

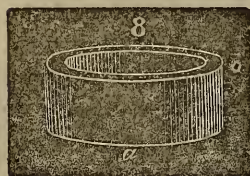
REMARKS IN RELATION TO PHOTOGRAPHY UPON METALLIC PLATES.*

From the French of Saint Germain-en-Laye, by J. R. Snelling, M. D.

DIAPHRAGMS.

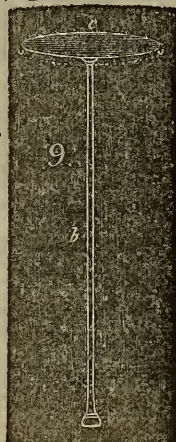


WHITE porous earthen ware tubes half baked appear to me, at the present time the best for use, and they last longer. Several manuals give the method to make them of plaster. They are also very good; but they soon soften and become too permeable. I will here describe the manner of casting them, because for the want of the former they may be very useful.



Make a casting of a lead ring 3 centimetres high by 8 of exterior diameter, and $6\frac{1}{2}$ interior diameter. It will consequently be $7\frac{1}{2}$ millimetres thick, and this thickness will determine that of the diaphragm.

Cut out two sheets of tin very thin and flexible, one 25 centimetres long by 32 wide, and the other 24 by 23 wide. Roll up these two sheets in such a manner that they will overlap a little and so you can by pressing the cylinder which either produces, diminish the diameter; having also a rod of tin 23 centimetres long (figure 9) and at one of its ends, solder very perpendicularly a round piece of tin, the edge of which will be a little bent around the rod, and the diameter of which will be equal to the interior of the ring including the thickness of a sheet of tin which will be interposed in the circle between it and the lead. These pieces put in their place, as I am about to describe form the entire mould.



If you wish to put it together, oil well the lead ring upon all of its surface; the surface cylinder of tin upon its exterior surface, the large on its interior surface,

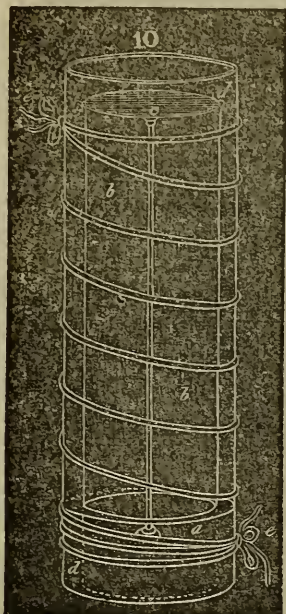
and the round tin with the rod on its circumjacent surface. Place the ring upon an even place, a marble slab for example, and introduce into this ring the small tin cylinder, in such a manner that its lower edge is in exact contact with the marble slab all around. The 3 centimetres in height of the ring serves to keep the tin cylinder very perpendicular and also form a tube with parallel walls. Then introduce into this tube, and at the same level with its rim or edge, the small circular tin, so that it will shut the tube as well as possible at the top, with the rod resting upon the bottom.

Afterwards surround the ring of lead with the large cylinder, and keep it in this position by means of a packthread which you must tie tightly around it, first winding spirally to the top of the tube, in such a manner that the diameter of this may be equal all around, and that the distance which intervenes between the two cylinders of tin may be the same in the whole of its circumference. The interior cylinder must be a centimetre lower than the exterior one, and it is this difference which forms, (after the plaster is leveled) the bottom of the diaphragm. Figure 10 represents the mould all set up ready for use.

Then take building plaster, well sifted; wet it as little as possible, that is to say do not put any more water to it than what is absolutely necessary, and pour it between the cylinders until it reaches the edge of the largest; but do not mix any more than will be necessary to make a diaphragm, because what remains should be thrown away.

Let it dry for at least fifteen minutes, and as soon as the plaster shall become of sufficient consistence, turn the apparatus upside down, and withdraw carefully the tin rod soldered to the little shield which has served to form the bottom. Then until the thread which maintains the exterior sheet of tin in its place. It immediately detaches itself from the plaster by its elasticity, and you remove it with care. Detach from the diaphragm the lead ring

which you will perceive all entire, then by compressing with the hand the interior cylinder of tin, you will diminish its diameter and thus be able to raise it without difficulty. The diaphragm being separated



from its mould let, it dry for at least fifteen days before using, or if you wish to shorten this time, dry it before the fire. It is advisable to prepare twelve or fifteen at a time.

I have made these diaphragms of fine plaster, coarse plaster *a mouleur*, and *platre abatir*, those made of the latter are the best; they last four times as long as the others and do not cost hardly anything. I am now trying very thin copper diaphragms, described in a scientific English Review lately published. They give me the same results at present as the best porous earthen tubes, and it appears to me that all other diaphragms will be necessarily rejected when they are to be plunged into excitant liquids, which do not attack those made of copper. In the pile of Daniel, which I use, they are perfect. With them, it is not possible to have the endosmose or mixing of the two liquids, and their uniform nature admits of an easy passage to the electric current. It is only necessary to isolate them completely from the copper and zinc elements of the pile. In my jar, they sink into the sulphate of copper through the small gallery, and are kept standing upon the bottom without touching either the walls of the gallery, or the coil of copper that supports it. The zinc

which dips into the acidulated water is suspended by a rod of glass instead of a rod of copper, and consequently does not have any connection with the metal of the diaphragm. The conductors are fixed in the usual manner.

In concluding what I have to say of the pile, I feel that I cannot too urgently recommend you to clean frequently with paper the glass rods and the wire conductors at their extremities, and also to clear the holes of the plates or appendages with a triangular punch, and every place indeed where the contact should be maintained. The metallic oxides are bad conductors, and the brighter the metals are at the point where they touch, the more rapid will be the transmission of the electric current.

DECOMPOSITION CELLS.

The decomposition cells are very difficult to construct when we wish to silver in the bath several large plates at a time. Wooden troughs, to which we may give any desired form, would be perfect if we could cover them on the inside with a varnish which would resist for a long time the action of the cyanides.* That described by several authors, and composed of wax, rosin, red ochre and white lime, is absolutely useless; because it is dissolved in a few hours by the silver bath of which I have spoken. The varnish which serves to protect the backs of plates would not I think resist a very prolonged immersion. In regard to the small oaken troughs, they are never tight enough to prevent the liquid from leaking at the joints, and the wood absorbs quite a large quantity of the metallic solution. The difficulty might be obviated by lining them with gutta percha. This is an experiment which I am making at the present time and which for twenty five days has succeeded admirably.

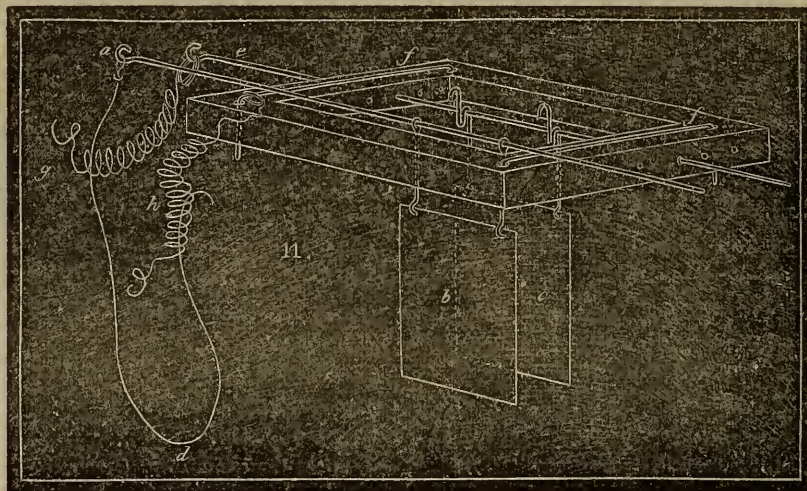
The oaken troughs or cells change the metallic bath into a very deep red, the color of madeira wine, but for all this without injuring its properties.

In the mean time, I use the glass jars which I have made expressly for the purpose, and which are 27 centimetres interior height by 27 in diameter. They may con-

* We have used asphaltum successfully as a lining to wooden galvanic troughs. Dissolve in turpentine and spread it with a painter's brush.—*Ed. P. A. J.*

tain from 12 to 14 litres each. The edge is so arranged that a glass placed on the top may prevent all evaporation. If I need

the apparatus, I raise the glass and replace it by a wooden frame (figure 11,) 4 centimetres square and 31 in length, from end



to end. The cell of glass is set into a circular notch dug out under the frame, so that it cannot slide in any direction. I make through two of the perpendicular and horizontal sides of the frame five holes from 4 to 5 millimetres in diameter, and corresponding with each other, in such a manner that I can, when the frame is placed upon the cell, pass through two of its holes situated opposite, and the one edge with the other, a copper rod which will thus be a little above the liquid parallel with its surface. I then fix upon the same sides which have been pierced two brass rods which rest on the wood, but the extremities of which at a right angle, entering two holes made near the edge, perpendicular to the axis of the horizontal holes. These two rods therefore will cut a right angle with that which I shall have placed in one of the five situations intended for the anode. Figure 11, already referred to will better explain this arrangement, which is extremely convenient.

The conductor proceeding from the copper pole of the pile is strongly fastened to a rod with a hook, which traverses horizontally the two opposite sides of the frame. The wire proceeding from the zinc pole communicates with one of the two brass rods resting flat upon the surface of the wood. I plunge into the bath the soluble anode suspending it by two small silver hooks (figure 12,) to the brass rod communicating with the copper pole.

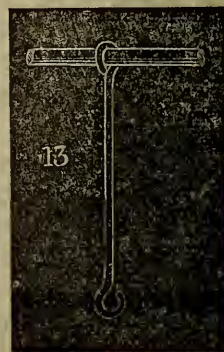
These hooks are so arranged that I can raise the soluble anode without displacing the rod. I suspend to another isolated rod, by means of copper hooks (figure 13,) the plate to be silvered which I wish to immerse and polish.



In this situation should I plunge it in the metallic bath, the action of the pile would not be set up until the rod to which the plate was suspended rests upon the two rods fixed in the wood, and consequently after the complete immersion of the plate; now, it is this which we have to guard against.

It is essential that the electrical current should be established by the uniform contact of the plate with the bath, and nothing is more easy to obtain:—fasten to the rod (a fig.

11,) to which the plate is suspended, quite a long very fine copper wire. With one hand, bring the free extremity of the wire in contact with the zinc conductor, or simply thrust the whole into the spiral which it forms, and with the other hand, plunge the plate *b* into the bath, in such a manner that it may be suspended parallel with the anode



c, the side to be galvanized turned towards it, and at a distance of 5 or 6 centimetres. It is necessary to calculate before hand the length of the small copper hooks, in order that the immersion of the plate may be complete.

I have recommended putting the plate quickly into the bath; at present I think it would be better, on the contrary, to plunge it in slowly, but steadily. It appears to me that by operating thus, the plates which I silver are less subject to attract water or be covered with streaks.

PRECAUTIONS TO BE TAKEN WHILE THE SILVER IS BEING DEPOSITED ON THE PLATES.

Two or three minutes after plunging a plate in the bath, it is necessary to withdraw it and examine its surface, which may always be done without inconvenience.

If it assumes a bluish, somewhat milky, tint uniformly, this will be an evidence that the operation is going on well; then replace the plate in the cell before it has time to dry, being careful to change its perpendicular position from time to time, by detaching one of the small hooks in order to place it in the third hole of the plate, which was not used in the first place.

If there is formed upon the plate spots, streaks, a diffusion of small white points, dark lines proceeding always perpendicularly from the top to the bottom, a dirty yellow coat passing to a violet, or finally a deposit of grayish dust, etc., withdraw it immediately from the bath, wash freely with water, repolish it well, and do not put it back into the cell until you shall have thoroughly remedied, if possible, the causes which produced these phenomena sometimes very discouraging, and well known to all who are engaged with electro-chemistry. They are almost always produced, either by the metallic solution being too strong, or the electric current too energetic. It is therefore necessary to increase the distance of the plate from the soluble anode, or replace this by another anode smaller and thinner, to employ finer conductors make use of zinc rods of a less extensive surface, or let but a small portion of it dip into the acidulated water. If this water were too strong or contained forty drops of sulphuric acid, do not put more than twenty drops into the fresh water. Remove as much as

possible the copper and zinc elements of the pile, or diminish, in short, the strength of the bath by adding distilled water. The employment of one, of several, or all of these means at a time, almost always succeeds.

If the soluble anode were covered with a brown oxide, or streaks, round points, and sometimes *fusees* formed by a thick matter, black or greyish, slightly adherent, but leaving a spot difficult to remove, this is owing to want of cyanide of potassium in the bath. It has not the excess desired for dissolving upon the anode the cyanide of silver which is formed; add therefore little by little until the phenomena cease to take place.

If, on the contrary, the silver solution or the electric current is too feeble, it will be necessary to remedy the difficulty by pursuing a directly opposite course from that which we have pointed out, and it will be easy to detect this defect by the slowness with which the deposit is made upon the plate.

In favorable circumstances and with a medium temperature, a large plate takes 8 decigrammes of silver in an hour, and this is more than necessary to obtain a complete proof.

I can galvanize in one of my cells two plates at a time by thus rendering useful the two surfaces of the anode.

When the plate is covered with the coating of silver which appears to me sufficient, I remove it from the metallic bath, wash it freely with water, take off one of its hooks and hang it up by the other to dry before shutting it up. It presents then a beautiful cream white, slightly azure, tint. If the water is not perfectly pure, it will leave yellowish traces upon the silver, but they disappear by polishing.

It is advisable to shut up in a box the plates which happen to be galvanized. Exposed to the air, dust, or moisture, they change upon some points of their surface, and the burnishing becomes more tedious and difficult.

The Soluble Anode.—We thus name a plate of the same metal as that which is invisibly contained in the metallic bath. In this instance therefore it will be of pure silver, and it will serve to replace in the silver bath what may be carried off by the plate. The anode ought to have an even

surface about half that of the plate which is galvanized. We increase or diminish its active surface by plunging more or less of it into the liquid, for the action is not exerted except upon the part which is immersed.

It is necessary that it should be rather thin, about 1 millimetre, in order that the electric current may not acquire too much energy. The soluble anode dissolving by degrees in the bath will finally disappear entirely, if it be not replaced, as soon as its volume becomes very small relatively to that of the plate which is being galvanized.

In relation to the bath, it serves indefinitely, since the anodes maintain it always at the same degree of saturation; but it will be well to filter it whenever dust or impurities from the plates soil it and form a deposit at the bottom of the cell.

Pure silver, in plate, in wire or small particles, costs about 25 cents a gramme. Eight decigrammes are sufficient for a proof on a whole sized plate, 4 for one of half size and 2 for a quarter size. But I speak here of plated sheets only; it would necessarily require much more, three times as much at least, if we wished to directly galvanize a copper plate; this first coating however being once established, this plate would be placed in the same condition with those which are already silvered at a better standard, and after three or four proofs have been rubbed off, it will only be necessary, in each new operation, to deposit the silver in the proportions which I shall hereafter describe.

ACCELERATIVE SUBSTANCE.

A long experience has induced me to think that the chloride of iodine was the substance which gave to daguerrean proofs the warmest and most brilliant tones, and I have constantly used it, in spite of the difficulties I have found to attend its use, with quite a complicated apparatus. Yet I think I have succeeded in making it play an important part in the preparation of the sensitive coating, without changing any of the methods generally followed.

I make bromide of lime absorb chlorine, which by combining in part with the excess of iodine of the preparation, forms upon all parts of the same plate this chlorine which gives me such good results. I have

long made numerous experiments with this substance which appears to me decisive.

I prepare in the usual manner what is called bromide of lime, that is to say, I evaporate bromine in a capsule placed at the bottom of a very tight box containing hydrated lime reduced to powder and passed through a sieve. When the lime, which it is well to prepare a little wet, has taken a red color, nearly similar to that of sealing wax, I remove what bromine the capsule may still contain, and I replace it, by a certain quantity of chloride of bromine. Under the action of the fumes which it diffuses, the surface of the bromide of lime fades and acquires a very deep yellow tinge. The mixture is then stirred with a strip of glass, and already we perceive that under this decolorized tone there is formed a coating of a very lively blood red color. Continue to stir, and produce the absorption of the chlorine vapor, until the whole mass assumes the same color and there remain yellowish red fumes in the part of the box which is void, fumes with which the saturated lime can no longer mix. Shut the chloro-bromide of lime in a bottle with a large opening, furnished with a stopple, and shake it briskly from time to time and for a day or two in order to render all the parts very homogeneous. Then use it precisely the same as the bromide of lime, either in basins, or in boxes with porous diaphragms, of which I shall soon speak. It is only necessary to give to the second iodizing almost the same intensity as the first; and it is perhaps to this excess of iodine, combining with a part of the chlorine set free, that the chloro-bromide of lime owes the warm and vigorous tones imparted to it. This, however is but a conjecture, and I do not by any means pretend to advance the least theory in relation to it. Whatever the cause may be, I have two boxes, one containing the lime thus prepared eight months, and the other fourteen months. I have made a hundred proofs with them, and I have always obtained not only remarkable tones, but a rapidity of luminous impression which I have not yet been able to understand. I always operate upon a large plate with object glasses of a long focus, I correct views or monument with the prism or parallel glass, I use a very small dia-

phragm, and have under these circumstances, which all require, a prolonged action of the light upon the sensitive coat, obtained very fine proofs in eight and five seconds in the sun, and in fifteen or twenty seconds, if it is hid by the clouds.

As to the proportions which ought to exist between the lime, the bromine and the chloride of bromine, it is impossible for me to give them, for I am far from knowing them. They depend, I think, upon the greater or less quantity of water contained in the lime. If this substance is too dry, it hardly mixes with the bromine fumes; if it is too wet, it absorbs a very large quantity and finally even *combines* with them, which is a misfortune. It is necessary therefore to grope along, and to be guided particularly by the color, like that of red sealing wax for the bromide of lime, passing to a blood red color by the fumes of chloride of bromine. The smell may also furnish favorable signs. It is necessary that the substance diffuse a strong odor of chloride of bromine, which is dangerous to respire.

If in spite of the intensity of the color, the bromoforme or iodoforme is not offensive to the organs, it is because of the combination, and the substance will be bad. We should remedy it by mixing with it little by little a certain quantity of hydrated lime very dry, and adding afterwards if required, chloride of bromine reduced to vapor.

BOXES FOR IODINE AND CHLORO-BROMIDE OF LIME.

I remarked that I had been some time making experiments with bromoforme, as the half baked earthen pipes, not only became readily impregnated with the fumes of iodine and bromine, but also sifted them, so to speak, letting them pass with constancy and great regularity through its substance. I have since thought that, if I could seal hermetically upon a plate of this porous earth a coating of uniform thickness of iodine or bromate of lime, by covering with a ground glass the surface of the earthen pipe opposite that which is found in contact with the above named substances, I should have extremely low basins and uniting the best conditions possible, especially for an apparatus designed to be transported often from place to place. Indeed, whatever joltings the box might receive,

whatever may be its position, sidewise, horizontal or upside down, the iodine and lime would always preserve uniform surfaces, upon one of which I might always place in perfect contact the silvered plate which is to receive the fumes. These boxes would therefore be at the same time like bottles hermetically sealed in which the iodine and bromine are preserved, and the double apparatus is intended to be used whenever we wish it. I have prepared two of these boxes within a short time, and they have answered as well as I expected. It appears to me even that in passing through this porous earth, the two substances modify in a favorable manner the photographic phenomena.

After experimenting and making such indispensable changes as were suggested to my mind, I constructed these boxes as follows:

I take of these half baked white earthen plates which are found in commerce and which are used by painters of porcelain for the purpose of submitting to the fire the piece which they have ornamented; and it is upon these plates that these *pieces immediately* lie in the oven. They are nearly 27 centimetres by 19 and 5 or 6 millimetres thick. They absorb water with such avidity that what a common sized tumbler contains would disappear into the thickness of this plate without passing through.

I cut very square, and of the desired size, the plate, which I will call *biscuit* to avoid all confusion, and this size will be that of the largest sheeted or *silvered* plates which I wish to make use of; 1 centimetre broader, however, upon each of its four sides. I would here remark that one box serves for all plates of smaller size, at least for holders in which the openings are different. The large normal plate which I use almost exclusively, being 217 millimetres by 162, I give the biscuit 237 by 192, and a thickness of 3 or four millimetres only, which I obtain by grinding the two sides very carefully when it is dry.

The biscuit being thus prepared, and especially of a uniform thickness, I trace with ink, one centimetre from the edge and upon each of its two surfaces, a line, which forms a kind of frame, and marks the space to be covered by the strips of glass, intended to compose a double flat basin, the interior surface of which will be

necessarily equal to that of the silvered plate. I then cut a glass 3 millimetres thick, into strips one centimetre wide and of a length corresponding with the sides of the biscuit. Eight are required for each surface. I grind them upon their four sides, in order that they may take well the thick glue which ought to fix the first four upon the same biscuit, and the second four upon the first four, to increase thus the height of the borders of the basin.

The gluing of these bands requires much care and some precautions. It is essential to heat to a pretty high temperature the biscuit and the strips of glass; it is necessary to use sufficient glue to prevent bubbles from remaining between the strips, yet we must avoid applying too much, because if it comes in contact with the porous earth, or spreads over it, ineffaceable spots result, where the iodine and bromine collect in a grievous manner. Finally, the lines of junction of the upper strips should cross at a right angle those of the lower strips, that is to say, if in the first, the strips extend the length of the biscuit, in the second, they ought to extend the width of it.

When this operation is effected upon the two surfaces, I have too small basins very low and constructed back to back upon the earth pipe which thus serves as a bottom for both. Their borders are formed by the double thickness of the glass strips.

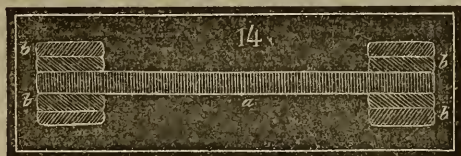


Figure 14 represents a perpendicular cut of this small apparatus, although quite incomplete.

At the end of a few hours, the whole is so dry that the four sides of the double basin may be ground in order to then glue upon it a strip of glass 3 millimetres thick for the purpose of preventing evaporation of the substances through the edge of the biscuit. This ought to be made dry, because the water if it were employed, would penetrate through the plate of porous earth, and thus coming in contact with the glue which holds the strips of glass, would soften it sufficiently to destroy their adhesion to the biscuit.

These bands which surround the double

basin will be as wide as it is thick and will complete the framing of the porous earth. Figure 15 will serve to make this arrangement better understood.



As soon as this new gluing becomes very dry, it will be necessary to grind perfectly the prominent borders formed by the stripes of glass. They are destined to receive on one side a glued glass which closes as hermetically as possible the iodine or chloro-bromide of lime, and on the other side, a glass well ground gliding upon it in order to conceal at pleasure the surface of the biscuit, or to uncover it whenever we wish to make use of the fumes which pass through. These borders will be constituted now by the upper surface of the strips of glass and the extent of the perpendicular glass which surrounds them on all sides.

I would here remark that by increasing the number of strips or by cutting them of a greater thickness, we would give to the basin, which is to contain the substances, the depth which is desired. For the iodine a thick coating of 5 or 6 millimetres is sufficient; but for the chloro-bromide of lime, it would be better to give a considerable thickness, 9 millimetres for example, since this substance becomes sensibly weaker by evaporation, and it is necessary to saturate it anew after a certain time.

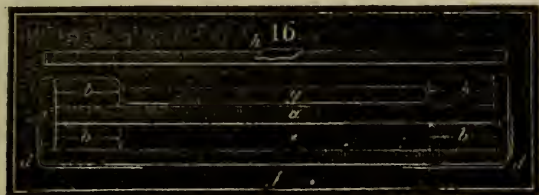
In the conditions which I am about to describe, if the gluing and the grinding are perfect, it will not be until the expiration of a year, or even more than that, that it will be necessary to renew the lime and make it absorb anew the bromine or chloride.

The boxes which I carried in my last journey were prepared fifteen or eighteen months ago. Upon my return to Paris, they were as good as at the moment of my departure. It served therefore nearly two years without the necessity of interfering with it.

The borders being perfectly ground, we can shut the substances in the two double basins, one of which is intended for the iodine, and the other for the chloro-bromide of lime. That which I shall describe

for one is necessarily applicable to the other.

In the first place cut a glass 3 millimetres thick (*f*, figure 16), and sufficiently



large, so that when placed flat upon the basin, it may cover it entirely, but without going beyond the exterior edge with which it must strictly coincide. It will be advisable to polish it in order that we may see at all times the tone of the substances which it covers. This precaution is especially necessary for lime colored red which changes its color by becoming weak. Place the iodine or chloro-bromide of lime in one of the cavities of the double basin (*e* of the same figure,) but without entirely filling it, in order to communicate to these substances by shaking them, a movement which causes a change in the situation of their molecules, and which, by thus equalising their general color, renders to the chloro-bromide of lime all of its homogeneity; for if any defect in the gluing of the strips should allow the fumes to pass out, we would immediately perceive a sensible decoloration near the point where the evaporation shall have taken place.

The void which is left in the basins may be calculated at nearly one twelfth of their capacity. Adapt the glass accurately upon the ground strips, keep it in its place by a sufficiently heavy weight, and by means of a ribbon of a suitable width—2 centimetres for instance—and glue very hot and thick, stick the glass strongly to the borders which it covers without being glued; the ribbon, as that shown in figure 16, letter *d*, binding the whole closely, being enveloped by the glue, overlaps a part of the exterior surface of the glass *f*, and a part of the exterior border of the basin *c*. It is well also, for greater security, to cover again the line of junction of the glass with the border, by a band of gutta-percha or very tough and carefully glued paper. It is necessary, in a word, to neglect nothing which will close every other passage except that of the surface of the biscuit to the fumes which are constantly liable to escape.

This arrangement permits us to open the basin whenever we wish without being obliged to break the large glass, for the glue gives strength to the bands and the porous earth such an adherence that it is impossible to separate them without breaking. We may also glue the glass which covers the iodine or lime upon the borders even with the basin; but it is necessary then to leave it in the first place upon one of its sides and entirely in one corner an opening 2 centimetres long, being in width the thickness of the superimposed strips of glass. It is by this opening and by means of a small low tunnel made by rolling up paper well glazed, that we introduce the substance into the empty space, included between the glass and the biscuit. We afterwards close the opening with a piece of glass which is adapted to the size and of a wedge shape to this opening, so that it cannot slip into the interior, and we glue the whole in the manner described. The conditions thus obtained are without doubt better than the preceding for preventing all evaporation, but it would be necessary to break the glass if we were compelled to open the box.

The upper basin, into which the fumes pass transmitted through the biscuit is covered with a ground glass (*h*, fig. 16) which shuts it hermetically and which bears the silvered plate. The whole is placed in a wooden box, similar to those which serve for the ordinary basin. It is necessary also, for preventing, as much as possible, all disengagement of fumes when the box is at rest, to adjust, in the interior of the upper basin, a ground glass (*g*, figure 16,) which will lie perfectly flat upon the biscuit. We remove it, by all means when we wish to use the box, and replace it when we are done.

This apparatus gives truly remarkable results, and at the expiration of seven or eight days, when the biscuit is well saturated by the fumes, the silvered plate which receives them passes successively through all the gradations of color known with a uniformity and constancy which is perfect.

The earthen ware which covers the iodine immediately becomes of a deep rust color, while that under which is the bromate of lime or chloro-bromate, never loses its whiteness. It is well, but never

indispensable, to impart to the biscuit a dark tinge, by stirring lamp black in ether mixed with spirit of wine, and spreading it on the porous earth by means of a flat brush. It is necessary, the day following, to remove with care by means of a hard brush, the excess of lamp black which has not penetrated the porous earth and which lies in the form of dust.

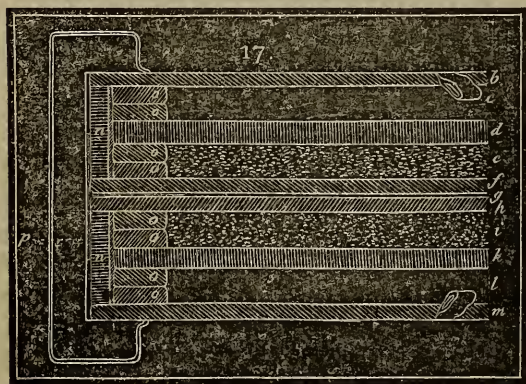
I have blackened the biscuit of my boxes, because being obliged sometimes to make use of them in full light, I have noticed that the white reflections from the bottom of the basin, would alter the sensitive coating of my plates sufficient to conceal the proofs.

We can blacken the biscuit, of one side only, either before constructing the basin, or when it is filled with iodine or chlorobromide of lime.

My two basins are situated back to back, in a box, each surface of which presents an opening intended to receive alternately the holder which supports the plate; when this is iodized, I turn the box upside down, and submit it to the chloro-bromide, then I turn it back once to give it the second iodizing.

The basins enter the box and are withdrawn through doors which shut on the side opposite to that where the two trap doors are situated through which the two ground glasses are removed by sliding them. This box is 6 centimetres thick, 21 wide, and 27 long. I can, whenever I wish, remove from the common box the double basins and place each of them in a separate box, which is the most convenient when we

more or less porosity, the greater or less quantity of bromine or chloride of bromine contained in the lime, the thickness of the coating of iodine or bromide of lime shut up in the basins, necessarily have an influence upon the rapidity with which the fumes are disengaged in the boxes and color more or less quickly the plate submitted to their action. But as it is by the color acquired by the plates that we are to judge the degree of sensitiveness, there is no other inconvenience attending the use of very slow boxes, except a loss of time, often very precious. I have noticed also that during the same day the same box became more slow in proportion as it was used, and I concluded that while it was at rest the fumes gradually sifting through the biscuit deposited at its superior surface a slight coating of iodine or bromine, which evaporates as quick as it is formed. It is necessary therefore to have at least two pairs of double basins, if we wish to work rapidly, and make a number of proofs in a short time. It is particularly necessary to employ in the construction of these basins half baked earth, the porosity of which permits an easy passage to the emanations of the iodine and bromine. I would recommend those who prepare the accelerative substances themselves to take every possible precaution to prevent troublesome accidents. Bromine, chloride of iodine, and chloride of bromine particularly, are corrosives of great energy. It would be imprudent to respire lime impregnated with these substances, if it becomes diffused in the state of dust through the apartment. It must consequently be placed in a current of air and at a window, when we prepare it or wish the air to pass over it. Ammonia and the concentrated solution of hyposulphite of soda have the happy property of destroying almost instantaneously their deleterious qualities; it would therefore be prudent to have it at hand when we unstop the bottles containing these substances to pour into the capsules. It is necessary above all never to let them fall from too great a height, for fear that some drops may spatter in the eyes, which would produce an irremediable injury. If it falls upon the hands or body, wash the spots immediately with a saturated solution of hyposulphite of soda; every trace of the spots will at once disap-



operate at a stationary place. Figure 17 represents a cut of one of the large sides of my double box.

The temperature of the place where we operate, the thickness of the biscuit, its

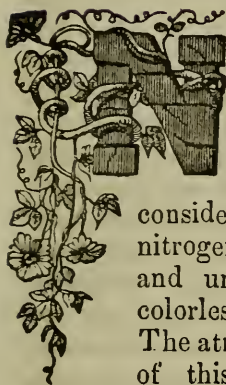
pear. If the odor which they exhale is too strong in the apartment, scatter around some ammonia. The invisible vapor of bromine and of the alkali combine and neutralize each other, giving rise to white fumes which are not deleterious. If, wishing to ascertain the strength of what is in the bottle by the smell, you draw in your

breath too forcibly so as to produce a lively irritation of the mucous membranes, breathe immediately of the ammonia. As for the rest, all of these accidents can be easily avoided by placing the substances, as I have said, in a strong current of air.

(To be Continued.)

CHEMISTRY. No. VII.

BY GURDON EVANS, A. M.



NITROGEN. Symbol N.
equivalent 14.06.

We have now given a brief sketch of the elements oxygen, hydrogen, and carbon, and will next consider some of the properties of nitrogen. It exists in its simple and uncombined state as a gas, colorless, tasteless, and inodorous. The atmosphere is the great source of this gas, being composed of about 79 parts of nitrogen and 21 of oxygen, with a little admixture of carbonic acid ammonia. It was formerly called azote, which signifies, not a supporter of animal life, and now, substances containing nitrogen, are often called *azotized* bodies.

Unlike carbonic acid it is constantly inhaled without any injury to the animal system, nor is it regarded as essential to animal life except as it dilates the oxygen, thus modifying or rendering less active the vitalizing influence of the oxygen inhaled. As a simple element it may be regarded as almost, or quite inert, neither supporting animal life or combustion, but in some of its compound forms it is a most active agent, and in several a corrosive and deadly poison.

Compounds of Nitrogen with Oxygen :—

	Symbol.	N.	O.	Equiv.
Protoxyd of nitrogen, (Nitrous Oxyd,)	NO	14.06	8	22.06
Deutoxyd of Nitrogen, (Nitric Oxyd)	NO ₂	14.06	16	30.06
Hypo Nitrous Acid,	NO ₃	14.06	24	38.06

Nitrous Acid,	NO ₄	14.06	32	46.06
Nitric Acid,	NO ₅	14.06	40	54.06

The above five compounds are all yet known of oxygen and nitrogen, and their symbols and figures expressing the proportions in which the two gases combine, are placed opposite the compounds named.

Nitrous Oxyd, or Laughing Gas, NO. composed of one proportion of nitrogen and one of oxygen, is made by heating nitrate of ammonia in a retort to near redness when the gas escapes. It should be passed through potash water, to purify it, before being breathed. A gallon repeatedly inhaled from a gas bag often produces the most exhilarating effects upon a person; usually inducing immoderate laughter and grotesque gesture, but often inducing a disposition to make a speech, or arouse the combative propensities to a dangerous degree. It should be administered with great care and only to healthy subjects.

Nitric Oxyd, NO₂, is a colorless gas, composed of one equivalent, or 14.06 parts nitrogen and two equivalents or sixteen parts of oxygen. It is made by digesting bits of copper in strong nitric acid, when the gas escapes, and if kept away from the atmosphere it entirely colorless, but when brought in contact with a new compound is formed, a blood red gas of a very pungent odor.

Hypo-Nitrous Acid, NO₃, is a thin, mobile liquid, formed by mixing, in a dry state, four measures of nitric oxyd, with one of oxygen, exposed to below zero; it

is of no special importance in the arts and little known.

Nitrous Acid, NO_4 , is a blood red gas produced by digesting slips of copper or metal in nitric acid. It contains four equivalents of nitrogen and one of oxygen. The gas may be condensed by cold into a yellowish fluid, and is a powerful acid.

Nitric Acid, or Aqua Fortis, NO_5 . This is by far the most important compound of N & O, and too well known to need any description. It may be made by distilling nitrate of Potash (Salt Petre) with strong sulphuric acid in a retort, and condensing the escaping fumes in a glass receiver. Nitric acid dissolves more of the metals than any other acid, and is of constant use in the arts and scientific experiments. It should be perfectly colorless and have a specific gravity of 1.5. It boils at 248° , always is combined with one equivalent of water, and freezes at 50° below zero.

Compounds of Nitrogen and Hydrogen Ammonia NH_3 is the only known compound of these elements. It is a gas, when pure, and when dissolved in water is called, aqua-ammonia, and when dissolved in alcohol, hartshorn.

Ammonia is produced by the decay of all animal and vegetable substances containing nitrogen, and is often detected by its odor in the vicinity of such decay.

Ammonia unites with most of the acids,

forming several very important commercial articles as chloride of ammonium or sal ammoniac; Nitrate and sulphate of ammonia, &c.

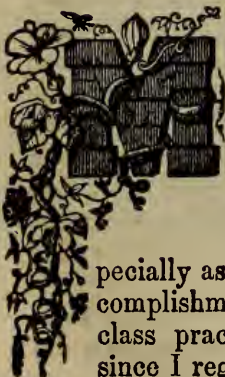
Ammonia is exceedingly volatile, and most of its salts are volatilized at a red heat.

Since it is constantly passing into the air, as it is produced by decay, it is always floating in the atmosphere in small quantities. In this state of vapor it has a strong disposition to combine with the water vapor of the air, and in this way brought down to the earth in dews, rain and snow and is of great benefit to vegetation thus brought within their reach, for it is indispensable to vegetable growth, especially to the maturity of the seed and fruit.

Compound of Nitrogen with Carbon. One compound only is known of these two elements—*Cyanogen*, NC_2 , is composed of one part of nitrogen 14, and two of carbon, 12. This substance combined with potash and the oxyd of iron, forms a series of salts of much importance in the arts; among them cyanide of potassium, the salt best fitted to dissolve silver for galvanizing daguerreotype plates and other metals for electro-metalurgic purposes. *Cyanogen* is rarely obtained pure, but ordinarily it is combined with iron and potash, as it is produced from blood and other animal matter rich in nitrogen and carbon — *Scientific Daguerrean*.

QUALIFICATIONS OF A FIRST-CLASS DAGUERREOTYPIST.

Extract from a manuscript volume soon to be published.



R. EDITOR.—I have already protested in your Journal, against the erroneous notions entertained by many, both as to the rank, the character, and the requirements of the heliographic art, and especially as to the qualities and accomplishments essential to a first-class practitioner of this art. And since I regard this topic, as of immense importance to the interests of helio-

graphy, I would in the present article enlarge still further upon it, and introduce some illustrations, which may serve to confirm the truth of my views,

Every one knows the world-wide difference between the artistic judgment of a crude, undeveloped person, and that of a genuine connoisseur. The child, the savage and the clown would prefer the flaming, glaring daub of a village painter on a sign-board, miscalled Washington or Jackson, to the exquisite outlines and subdued tintings of a Madonna by Raphael or Cor-

reggio. And the same imperfection and crudity of taste belong, in a greater or less degree, to a large class—probably we should say, the majority of the community. Not, indeed, for want of the original capacities to form true judgments, but for lack of the proper culture. It is this immature taste, to which appeal is successfully made by those portrait and miniature painters and daguerreotypists, whether itinerant or stationary, whose productions are an eyesore and a heart-ache to all genuine artists and connoisseurs. These productions perpetuate, if not aggravate, the barbaric ignorance already existing, since they shut out the introduction of better specimens and harden and habituate the mind to its preference of a low standard.

Both self-interest, then, and a regard for the general weal demand of genuine artists and men of pure taste to put forth their utmost efforts for correcting and elevating the artistic judgments of the masses. It is not, in this case, that men “love darkness rather than light because their deeds are evil,” but because they know no better. Something to this end, I trust, may be done by analysis and the exposition of principles. My present concern is with the daguerreotype exclusively, and my remarks will be restricted to this.

In the daguerrean room, as everywhere else, may be found two classes of men, the artists and the mere mechanics. In all or most respects, save two or three, the latter may equal or even surpass the former. The solar pencil will, of course, transcribe *exactly* the subject submitted to in the one case, as in the other, and in the getting up of the plates and other processes whether manual or chemical, the mechanic may transcend the artist. But when we come to *expression*; to those items, which give the semblance of *life*, instead of a mere *shadow* of life; and especially to those particulars which must needs be observed in order, that the subject may look his best and highest; here at once flashes out the difference—an immeasurable difference—between these two classes of men. Between their productions the antagonism is as great, as between the sound and its echo, between a living man and the ghost of a man. No stream can rise higher than its fountain. The mechanic is the putter-together of *dead materials*, and his work must

be and cannot *but* be *dead*. The artist is a *creator* and into *his* work he breathes the “breath of life” and it “becomes a living soul.” Mrs. Fanny Kemble, once looking at a portrait by one of our widely celebrated artists, remarked, “Mr. — paints a most beautiful picture—the shape and coloring of all the various parts are exquisitely done,—but it requires Sir Thomas Lawrence to *put the soul in the eyes*.” An apt illustration of what I have said above.

This distinction applies universally, nor does it matter whether the pencil or the camera be the instrumentality employed. The time is not far distant I suspect, when the *perfect* handling of the camera will be acknowledged as difficult, as that of the camel’s hair pencil.

In a previous communication I stated my impression that ere long, persons, who are *artists* in judgment, in feeling and in execution, if not in *name*, will be connected with every respectable daguerrean establishment and have the entire charge of the camera. My conviction of this fact is, at present, even stronger than when I wrote that sentence. Every day’s experience and observation deepen my conviction, that the daguerreotype, small as is the honor hitherto attached to it, and disgraced as it has been by egotistic quacks and dullards of every grade, is nevertheless a sphere, wherein the loftiest and most expansive of artistic geniuses, a Michael Angelo and a Raphael, a Titian, a Rubens and a Rembrandt might find amplest scope for the exercise of their powers. And when heliography assumes its rightful place, as one among the noblest of the Fine Arts, imperatively demanding, in its practice, high genius, various culture and manifold accomplishment, then all mere mechanical operators will by the general voice be excluded from the profession, and the genuine heliographer will be a “a power among men,” and like the eminent painter or sculptor will be nigh overwhelmed with honors and patronage. I repeat, then, in slightly varied phrase, that no one is fit for a daguerreotypist or should presume to attempt the practice of the art who has not the genius for becoming, if not a pre-eminent, at least a highly respectable painter.

Why it is that genius and culture are

required in the heliographist, and that mere mechanical aptitude and dexterity are insufficient, may, I think, be made clear by one or two familiar illustrations.

Thus, what does the purest and most refined taste aim at in a lady's costume? Simply this, that it be such, as to make her look as well, *as nature, aided by art, will permit*. To this end, the fashion of the dress, the selection and disposition of the colors of its materials &c. &c., must all be such, as best match her size, her configuration, her complexion and her style of expression. So great is the difference between different persons in these respects, that the same costume may give to one a beautiful and to another an ugly appearance, simply because it is *suited* to the one and not to the other. But a costume fulfilling the conditions above named serves, in a great degree, to supply organic defects, to throw redundancies into shade and bring actual beauties conspicuously into view.

The philosophy of this matter may be stated thus. Nature *aims* ever at the highest beauty, the utmost perfection. But, in moulding the human frame, her creative force is intercepted by numerous causes peculiar to our present stage of being; among which are the stubborn, unpliant quality of the material composing the body, the defects inherited from progenitors, the casualties, by which the individual is frequently marred during corporeal development, &c. &c. The consequence of all these obstructions is, that faultless complete beauty is rarely, if ever witnessed.

In striving, then, to rectify imperfections or deformities by means of art, we do not contravene and impeach the ordinations of nature, but, on the contrary, we justify and co-operate with her. . . In other phrase, by help of powers and instrumentalities borrowed from herself, we do somewhat towards completing and bringing out into view that ideal of beauty, which, nature aimed at and would have attained, had she been dealing with that more ductile and tractable material, of which the spiritual organism is compounded, instead of the gross, unpliant clay, out of which the present body is wrought.

On the same principle, the painter of true genius, when limning a human face, does not represent it, in all minutest particulars *exactly as it is*, with every casual

wart, bunion or freckle, that may now disfigure it, but, to the utmost of his ability, precisely as it *would* be, if nature's *moulding idea*, instead of being partially thwarted by the impracticability of the material she was obliged to employ, had been distinctly and fully expressed. For this reason it is, we say of a portrait by the pencil of an artist—genius, that “it is a *perfect likeness*, and yet far handsomer, than the original!”

Acting in accordance with the same law, by cultivation, grafting, pruning &c., we elevate the puny, acid, worthless native apple into that large, beautiful, delicious fruit, which charms and delights three senses, instead of affronting all. Shakspeare, the unrivalled interpreter of nature, has compressed this whole philosophy into a few lines;

“ You see, we marry
A gentler scion to the wildest stock;
And make conceive a *bark of baser kind*
By *bud of nobler race*. This is an art
Which does *mend nature*—change it rather; but
The *art itself is nature*.”

This principle is of absolutely universal application.

Now what the lady does for her personal appearance by means of costume; what the painter does for his subject with his pencil; the heliographist is called upon to do for his sitter, through the instrumentality of his camera and various accessories beside.

One chief desideratum is to summon into his subject's face the expression he would catch,—that is, the best and noblest and most genial expression, of which it is susceptible. In a former article I have enumerated sundry incidental helps towards this end, such as the fitting up of the daguerrean rooms, &c. &c. But the main instrument, after all, for this purpose is the operator's penetration and tact, and the magnetism of his personal influence. And, as the diversities among mankind are infinite,—no two, even, being exactly identical in mind, feeling and character,—his versatility and power of adaptation to different individualities must be infinite also. Of consequence, no mere *mechanical* aptness is adequate to the exigencies of the case. Nothing save *genius* will serve,—that intuitive penetration, which no study can acquire; that flashing vision, which

comes from the great Light of Lights alone, and which sees with infallible accuracy, it knows not and cannot explain, even to itself, how or why.

The desired expression being called up, it remains so to regulate the attitude of the sitter and so to arrange the camera, as while procuring an accurate, rightly shaded, well rounded, and *distinctly pronounced* portrait of him, at the same time to throw into shade all defects of the face and bring prominently into view its best lines, and finest features. In short, to do for his

subject's face what I have described the true pictorial artist as doing for his. Again I say, no mechanical skill is sufficient for this. It is an achievement reserved for genius alone.

I need not extend these remarks further. If any one should feel an interest in this subject,—and most assuredly it is one of vast importance,—the suggestions I have offered, coupled with their illustrations, are quite sufficient to put him in possession of my ideas.

M. A. Root.

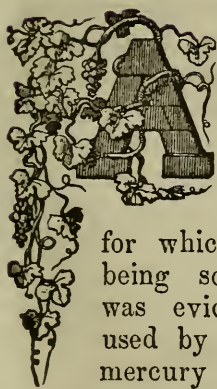
Phila., 140 Chestnut St.

From the Scientific Daguerrean.

PICTURE MAKING.—No. VI.

DEVELOPING THE PICTURE OVER MERCURY.

BY D. D. T. DAVIE, PHOT.



large high bath for mercurializing the plate is in all cases desirable. The bath manufactured by the Messrs. Lewis, is a neatly arranged affair, but is altogether unfit for the purposes

for which it is used, owing to its being so exceedingly shallow; it was evidently invented and is used by such as like to see the mercury coarsely deposited on the plate, or sudden transitions from light to shade, abrupt dark shadows &c. The blending of light and shade and softness of tone depends much upon the height of the bath and heat of the mercury; 11 to 13 inches is sufficient height, and will be used with decidedly more certainty than a low bath. One of the greatest nuisances ever entailed upon any process in the daguerreotype art, is the mercury tube or thermometer attached to the bath. Exposed as it is, to such variations of heat, it cannot be a guide; but on the contrary, it is continually bewildering the operator, and is never, under any circumstances, to be relied upon; hence it is worse than useless. The true way

to determine the amount of heat is by the size of the flame, which is simple in the extreme, and all daguerreans who have not sufficient judgment to determine this matter in this way, had better turn their attention to a business less difficult and less complicated than daguerreotyping.

To avoid the evils of the low bath, which I have mentioned, some have adopted the use of filtering paper placed over an iron rack, near the top of the bath, which, accordingly to their philosophy, filters the vapor of mercury, and renders it soft or fine; while others have formed a small retort in the bottom of their bath with an iron wire cloth covering, and by this means attempt to soften their vapor. I have tried all of these methods; I have also used the high bath for three years, and find it all that can be desired. Some are using Lewis', both with a second story of wood and a window glass in one side through which to examine the picture at intervals, during the mercurializing process: this is equally foolish, for with the high bath properly attended to, 999 of every 1000 plates may be better and more delicately mercurialized, than any one can do them where he depends upon observation through glass

by artificial light. The quantity of mercury used in the bath is not very essential, from one to four ounces (I use about two ounces) at a time, but much depends upon the quality and manner in which it is used. No mercury but that which has been carefully distilled, is suitable for developing pictures; the market is, however, flooded with impure stuff, called distilled mercury, which has been merely washed with acid, and after being used for a short time becomes thick and oxidized, and can be purified or restored only by distillation. The distilled mercury will, by exposure to heat and atmosphere, oxidize more or less, but may be purified and rendered limpid as ever by washing in diluted nitric acid or sulphuric acid. I have been most successful with my mercury by dividing a quantity into two parcels, and change once a week; while I was using the one, let the other stand in a dilute solution of sulphuric acid, and so use them alternately. Three minutes is the time I usually give my pictures over the mercury—sometimes a little more, and sometimes less, dark drapery and dark complexions require more mercury than light ones: or if after my picture was timed in the camera, I feared I had given it too much time, I would use less mercury; or if not timed quite enough I would use more, the latter would not do however, with a low

bath, for the darker parts would present a very coarse deposit. It is not necessary to filter mercury oftener than once a week, especially when used according to the foregoing recommendations.

The best method that I know of for bringing the plate in contact with the mercury is, by placing the slide over the bath. The deposit of the vapor upon the slide, is an objection to this mode, but it is not as objectionable nor so dangerous as removing the plate, and thereby exposing it to the light. The mercury should be kept heated uniformly, from morning till night, as it is utterly impossible to manage the heat otherwise, so as to mercurialize uniformly;—the bath should not stand in a current of air as that would have a tendency to vary the heat.

The amount of mercury as well as the quality that is amalgamated with the silver, has, in my opinion, much to do with the roundness and also the durability of the impression. Upon this subject, I will, add that experience has taught many a valuable lesson in daguerreotyping, one of which is, that the picture that is thoroughly mercurialized is durable as the painting or engraving, if the plate is otherwise properly prepared; while the one lightly mercurialized will fade away like summer beauty.

HELIOGRAPHIC PROCESSES ON PAPER AND GLASS.

MR. MALONE'S PROCESS.



SOME very ingenious experiments have been made by Mr. Malone, from whose communication the following remarks are quoted:—
 "To the white of an egg its own bulk of water is to be added; the mixture, beaten with a fork, is then strained through a piece of glass, cleaned with a solution of caustic potash, or any other alkali, is to be washed with water and dried with a cloth. When the glass is about to be used, breathe on it, and rub its surface with clean new blotting pa-

per; then, to remove the dust and fibres which remain, use cotton wool or a piece of new linen. Unless this latter, and, indeed, every other precaution, is taken to prevent the presence of dust, the picture will be full of spots, produced by a greater absorption of iodine (in a subsequent process) in those than in the surrounding parts.

"On the clear glass pour the albumen, inclining the plate from side to side until; it is covered; allow the excess to run off at one end of the corners, keeping the plate inclined, but nearly vertical. As soon as the albumen ceases to drop rapidly, breathe on or warm the lower half of the plate; the warmth and moisture of the

breath will soon cause it to part with more of its albumen, which has now become more fluid: of course, care must be taken to warm only the lower half. Wiping the edges constantly hastens the operation. Until this plan was adopted, the coatings were seldom uniform; the upper half of the plate retained less than the lower. When no more albumen runs down, dry the plate by a lamp, or by a common fire, if the dust that it is inclined to impart be avoided.

"The next operation is to iodize the plate. Dilute pure iodine with dry white sand in a mortar, using about equal parts of each; put this mixture into a square vessel, and place over it the albumenized plate, previously heated to about 100° Fah. As soon as the film has become yellow in color, resembling beautifully stained glass, remove the plate into a room lighted by a candle, or through any yellow transparent substance, yellow calico for instance, and plunge it vertically and rapidly into a deep narrow vessel containing a solution of one hundred grains of nitrate of silver to fifty minims of glacial acetic acid, diluted with five ounces of distilled water. Allow it to remain until the transparent yellow tint disappears, to be succeeded by a milky-looking film of iodide of silver. Washing with distilled water leaves the plate ready for the camera.

"It may be here noted that the plate is heated in iodizing for the purpose of accelerating the absorption of the iodine: an exposure to the vapor for ten minutes, with a few seconds' immersion in the silver solution, has been found to be sufficient."

Hydrochloric acid, chlorine or bromine, may be used with the iodine to give increased sensibility to the plate.

The plate is removed from the camera, and we pour over it a saturated solution of gallic acid. A negative talbotype image is the result. At this point previous experimentalists have stopped. We have gone further, and find that by pouring upon the surface of the reddish brown negative image, during its development, a strong solution of nitrate of silver, a remarkable effect is produced. The brown image deepens in intensity until it becomes black. Another change commences—the image begins to grow lighter; and finally, by perfectly natural magic, black is converted

into white, presenting the curious phenomenon of the change of a talbotype *negative* into apparently a positive daguerreotype, the positive still retaining its negative properties when viewed by transmitted light.

To fix the picture, a solution of one part of hyposulphite of soda in sixteen parts of water is poured upon the plate, and left for several minutes, until the iodide of silver has been dissolved. Washing in water completes the process.

"The phenomenon of the daguerreotype," says Mr. Malone, "is in this case produced by very opposite agency, no mercury being present; metallic silver here producing the lights, while in the daguerreotype it produces the shadows of the picture. We at first hesitated about assigning a cause for the dull white granular deposit which forms the image, judging it to be due simply to molecular arrangement. Later experiments, however, have given us continuous films of bright metallic silver, and we find the dull deposit becomes brilliant and metallic when burnished. It should be observed that the positive image we speak of is on glass, strictly analogous to the daguerreotype. It is positive when viewed at any angle but that which enables it to reflect the light of the ray. This is one of its characteristics. It must not be confounded with the continuous film image which is seen properly only at one angle; the angle at which the other ceases to exist. It is also curious to observe the details of the image, absent when the plate is viewed negatively by transmitted light, appear when viewed positively by reflected light."

MR. MAYALL'S PROCESS.

Mr. Mayall has recently published a form of process, employed by M. Martin, which differs in no essential particular from those already described; but as involving some niceties of manipulation, on which, the writer says, depends the perfection of his finished pictures, it is thought advisable to quote it.

"First. The albumen of a *fresh* egg must be beaten into a snow-like mass with a bunch of quills, dropping into it ten drops of a saturated solution of iodide of potassium; allow it to stand six hours in a place free from dust, and moderately warm—say 60°.

"Second. A piece of hand-plate glass, eight inches by six, with the edges ground smooth, must be cleaned as follows: with a piece of cotton wool rub over both sides with concentrated nitric acid, then rinse well with water, and dry. Stick a wafer on that side which I will now call the back, to mark it; pounce upon the face a moderate quantity of fine tripoli, moistened with a few drops of a concentrated solution of carbonate of potash; then with a piece of cotton wool rub the surface briskly in circles for about five minutes; then with dry tripoli; then with clean cotton to clear away all the dusty particles.

"Third. To the centre of the back stick a gutta percha ball, as a handle: strain the prepared albumen through the clean linen; pour it gently into the centre of the cleaned side of the glass, keep it moving until the surface is entirely covered, run it into the corners, and finally pour off any excess at the four corners; disengage the gutta percha handle, and place the glass on another slab, that has been levelled by a spirit level, in a place perfectly free from dust, and moderately warm. I will call this my *iodo-albumenized glass*; it will keep for any length of time, and may be prepared in daylight.

"Fourth. To excite (a yellow shaded light only being used), dissolve 50 grains of nitrate of silver in 1 ounce of distilled water and 120 grains of strong acetic acid; pour the whole of this solution into a *cuvette*, or shallow porcelain dish, a little larger than the glass plate; place one end of the iodo-albumenized glass in the solution; with a piece of quill support the end of the glass, and let it fall suddenly on to the solution, lifting it up and down for ten seconds; take it out and place it face upwards in another dish, half filled with distilled water; allow the water to pass over the surface twice; take out the glass, rear it up to dry; it is ready for the camera, and will keep in this state ten days,—of course shut up from daylight, in a moderately warm place, but never moist. The solution may be filtered into a black bottle, and will do again by now and then adding a few drops of acetic acid, and keeping it in the dark. Expose in the camera from four to ten minutes, according to the amount of light and the aperture of the lens. Suppose I say a lens of

three inches diameter, sixteen in focus for parallel rays, a one inch diaphragm placed three inches in front of the lens (one of Ross's photographic lenses is just the thing), the exposure would be in good light about five minutes.

"Fifth. Develop as follows. Place the glass, face upwards, on a stand with adjusting screws to make it level; pour a concentrated solution of gallic acid over the surface; the image will be from half hour to an hour in coming out. It is best to apply a gentle heat, not more than 10°. Should the image still be feeble, pour off the gallic acid, rinse the proof with water, and pour on to it equal quantities of acetonitrate of silver and gallic acid reduced one half with water. The image will now quickly develop; arrest it in four or five minutes, wash it well in three waters, and fix with hyposulphite of soda as follows:

"Sixth. Three dracms of hyposulphite of soda to one ounce of water. Allow the proof to remain in this solution until all the yellow iodide disappears, wash it well, rear up to dry, and it is finished.

"Success is sure to attend any one practising this method, provided the *eggs are fresh* and the *glass is clean*: if the glass is not clean, or the eggs are stale, the albumen will split off in the fixing.

"*Caution*—Wash all the vessels, as soon as done with, with nitric acid, and then with water. Every precaution should be used to avoid dust. The albumen of a duck's egg is more sensitive than that of a hen; and from an experiment of to-day, I am almost certain that of a goose is more sensitive than either."—*Athenæum*, No. 1220.

MISCELLANEOUS MODIFIED PROCESSES.

Several other preparations have been employed, with variable success, and recommended for procuring an absorbent film upon glass plates—amongst others the serum of milk has been used by M. Blanquart Everard; others combine with their albumen or gelatine, grape sugar and honey; the object of these being to quicken the process, which they appear to do in virtue of their power of precipitating the metals from their solutions.

Blanquart Everard has lately communicated the following to the Paris Academy of Sciences, as an instantaneous process:

"Fluoride of potassium added to iodide of potassium, in the preparation of the negative proof, produces instantaneous images on exposure in the camera. To assure myself of the extreme sensibility of the fluoride, I have made some experiments on the slowest preparations employed in photography—that of plates of glass covered with albumen and iodide, requiring exposure of at least sixty times longer than the same preparation on paper. On adding the fluoride to the albumen and iodide, and substituting for the washing of the glass in distilled water after treatment with the aceto-nitrate of silver, washing in fluoride of potassium the image immediately on exposure in the camera obscura, I have indeed obtained this result (but under conditions less powerful in their action) without the addition of the fluoride to the albumen, and by the immersion only of the glass plate in a bath of fluoride after its passage through the aceto-nitrate of silver. This property of the fluorides is calculated to give very valuable results, and will probably cause, in this branch of photographic art, a change equally as radical as that effected by the use of bromine on the iodized silver plates of Daguerre." A process published in the author's *Researches on Light*, in 1844, and named the Fluorotype, sufficiently establishes my claim to priority in the use of the fluorides.

Messrs. Ross and Thompson, of Edinburgh, at the meeting of the British Association in that city, exhibited some positive images on glass plates: these were backed up with plaster of Paris, for the purpose of exalting the effects, which were exceedingly delicate and beautiful.

Messrs. Langenheim, of Philadelphia, have, however, recently introduced into this country specimens, which they term Hyalotypes. These are positive pictures, copied on glass from negatives, obtained upon the same material. Their peculiarity is the adaptation of them for magic-lantern sliders. The process by which they are produced is not published, but judging from the effects obtained, the probability is that a very slight variation only from the processes described has been made. The idea is an exceedingly happy one, as by magnifying those images which are of the utmost delicacy and the strictest fidelity, perfect reflexes of nature are obtained.

There can be no doubt but other means of coating glass with sensitive materials may be employed. Certainly the use of albumen is a ready method, but this medium appears to interfere with the sensibility which it is so desirable to obtain. As stated, by using combinations of iodide and fluoride salts, there is no doubt but the sensibility may be most materially improved, and we find many of the continental photographers using honey and grape sugar with much advantage.

I would, however, venture to suggest that films of silver precipitated from the solution of the nitrate by grape sugar, aldehyde, or gun-cotton dissolved in caustic alkali, upon which any change could be afterwards produced, appear to promise many important advantages.

POSITIVE PHOTOGRAPHS FROM ETCHINGS ON GLASS PLATES.

A very easy method of producing any number of positive photographs from an original design is in the power of every one having some slight artistic talent. The merit of having suggested the process I am about to describe has been claimed by Messrs. Havell and Wellmore, and also by Mr. Talbot; indeed, there appears no reason to doubt the originality of either of these gentlemen, Mr. Havell having prosecuted his experiment in ignorance of the fact that Mr. Talbot had used the same means to diversify his photographic specimens. Mr. Talbot proposes that a plate of warmed glass be evenly covered with a common etching ground, and blackened by the smoke of a candle. The design is then to be made, by carefully removing from the glass all those parts which should represent the *lines* and *shadows*, and shading out the middle tints. It will be evident that the light passing through the uncovered parts of the glass, and being obstructed by the covered portions, will impress on the white photographic papers a correct picture, having the appearance of a spirited ink drawing.

Mr. Havell's method was to place a thin plate of glass on the subject to be copied, upon which the high lights were painted with a mixture of white lead and copal varnish, the proportion of varnish being increased for the darker shading of the picture. The next day, Mr. Havell

removed, with the point of a pen-knife, the white ground, to represent the dark etched lines of the original. A sheet of prepared paper having been placed behind the glass, and thus exposed to light, a tolerable impression was produced; the half tints had, however, absorbed too much of the violet rays, an imperfection which was remedied by painting the parts over with black on the other side of the glass; if allowed to remain too long exposed to the sun's rays, the middle tints became too dark, and destroyed the effect of the sketch. Another method employed by Mr. Havell was to spread a ground composed of white lead, sugar of lead, and copal varnish, over a plate of glass, and having transferred a pencil drawing in the usual manner, to work it out with the etching point.

Various modifications of these processes have been introduced by different artists, and they evidently admit of many very beautiful applications. When the etching is executed by an engraver, the photograph has all the finish of a delicate copperplate engraving. The only thing which detracts from this method of photography is, that the great merit of self-acting power is abandoned.

ALBUMENIZED PAPER.

M. Le Gray gives the following as the improved proportions in which he recommended an albuminous mixture to be made for paper.

White of Eggs,	2 fluid ounces and a half.
Iodide of Potassium	56 grains.
Bromide of Potassium	15½ "
Chloride of Sodium	4 "

M. Le Gray, in his memoir, gives the following general directions:—

Pour the solution into a dish placed horizontally, taking care that there is no froth; then take the paper that you have chosen, and wet it on one side only, beginning at the edge of the dish which is nearest to you, and the largest side of the sheet, placing the right angle on the liquid, and inclining it towards you; advance it in such a manner as to exercise a pressure which will remove the air-bubbles. Place before you a light, so as to be able to perceive the bubbles, and to push them out if they remain.

Let the leaf imbibe for a minute at most,

without touching it; then take it up gently, but at once, with a very regular movement, and hang it up by the corner to dry.

You prepare thus as many leaves as you wish in the same bath, taking care that there is always about a quarter of an inch in depth of the solution in the dish; then place your sheets (thus prepared and dried) one on the other between two leaves of white paper, and pass over them several times a very hot iron, taking out a leaf each time: you will thus render the albumen insoluble.

The iron should be as hot as it can without scorching the paper.

Then make use of this negative paper exactly like the first paper named; only great attention must be observed that the immersion in the aceto-nitrate bath is instantaneous, and that the air-bubbles are immediately driven out; for every time you stop you will make stains the same as on glass. It is also necessary to heat moderately the gallic acid.

One of the best services rendered by the albumen to photography is, without doubt, its application to the preparation of the positive paper, to which it gives a brilliancy and vigor difficult to obtain by any other method; which is prepared thus:—

Take white of eggs, to which add the fifth part by volume of saturated solution of chloride of sodium; then beat it into a froth, and decant the clear liquid after it has settled for one night.

With this the paper is first washed, and then with a strong solution of nitrate of silver.

M. Blanquart Everard published a process as his own, in France, and received the compliments of the Academy of Sciences for it, which in no respect differed from Mr. Talbot's: this, therefore, requires no further notice; but a modification of M. Niepce de St. Victor, and his own application of albumen, must not be neglected.

Method of preparing paper with albumen, so that it may be employed dry.

—The paper prepared by means of albumen possesses properties analogous to those prepared by means of serum, but in much less degree: the former, like the latter, may be kept for an indefinite time

after its preparation with the iodide of potassium, but after having been submitted to the action of the aceto-nitrate of silver it will not keep good beyond the next day. The impressions obtained by means of the following preparation are admirable: though not so well defined as those on glass, yet they are more beautiful, as the outline is less harsh, and they possess more harmony and softness. We consider this to be quite a triumph for those who exercise themselves in the photographic art.

Beat into a froth the whites of eggs, to which a saturated solution of iodide of potassium and bromide of potassium has been added, in the proportion of thirty drops of the former and two drops of the latter for the white of each egg; let the mixture stand until the froth returns to a liquid state, filter through clear muslin, and collect the albumen in a large flat vessel. On this lay the paper to be prepared, and allow it to remain there some minutes. When it has imbibed the albumen, lift it up by one of its corners; let it drain, and lastly dry, by suspending it with pins to a line or cord across the room. The subsequent preparation with the aceto-nitrate of silver is in every respect similar to that above described for the paper prepared with serum; care being taken not to dry it between the two folds of blotting-paper

until it has become perfectly transparent. The exposure of the prepared paper to the light in the camera is done in the same way, and the same treatment with gallic acid is followed: it will, however, be found that the time required for exposure will generally be four or five minutes.

Preparation of albuminous paper for receiving a positive image.—The positive paper prepared with albumen gives impressions somewhat shining, but of a very rich tone, well defined, and of perfect transparency; it is prepared in the following manner:—To any quantity of white of eggs add 25 per cent by weight of water, saturated with chloride of sodium; beat into a froth, and filter as in the previous operation,—only in this case leave the paper in contact with the albumen for only half a minute; hang it up to dry, which it usually does in six to eight minutes; then lay it on a vessel containing a solution of 25 parts of nitrate of silver in 100 parts of water. Leave the paper on the solution for at least six minutes, then place it on a plate to dry.

The serum of milk has also been employed on paper as the quickening agent, and some of the French authorities speak highly of it; but I am not enabled from my own experience to speak of its advantages.

LIFE OF HENRY FUSELI.*

BY A. CUNNINGHAM.



HIS picture the artist exhibited, expecting that justice from the penetration of the public which the genius deserved that taught him to give plausibility to a compound of heterogeneous forms, to inspire them with suitable soul, and to imitate the laws of existence: he was mistaken. The novelty of the conceit eclipsed the arts that had embodied it; the artist was absorbed in his subject, and the unbounded

praise bestowed was that of idle, restless curiosity gratified. Sick of gods and goddesses, of demigods and pure human combinations, the Athenians panted only for what was new. The artist, as haughty as irritable, ordered his picture to be withdrawn.—‘Cover it, Miccchio,’ said he to his attendant, ‘cover it, and carry it home, for this mob stick only to the clay of our art.’—Such were the limits set to invention by the ancients; secure within these, it defied the ridicule thrown on that grotesque conglutination which Horace exposes; guarded by these, their mythology scattered its

* Continued from page 62, Vol. 6, No. 1.

metamorphosis, made every element its tributary, and transmitted the privilege to us on equal conditions. Their Seylla and our Portress of Hell—their demons and our spectres—the shade of Patroclus and the ghost of Hamlet—their naiads, nymphs and oreads, and our sylphs, gnomes, and faries—their furies and our witches—differ less in essence than in local temporary social modifications; their common origin was fancy operating upon the materials of nature, assisted by legendary tradition and the curiosity implanted in us of diving into the invisible; and they are suffered or invited to mix with or superintend real agency, in proportion to the analogy which we discover between them and ourselves.—Pindar praises Homer less for that ‘winged power’ which whirls incident on incident with such rapidity, that, absorbed by the whole, and drawn from the impossibility of single parts we swallow a tale too gross to be believed in a dream, than for the greater power by which he contrived to connect his imaginary creation with the realities of nature and human passions; without this, the fiction of the poet and the painter will leave us rather stupified by its insolence than impressed by its power; it will be considered only as a superior kind of legerdemain—an exertion of ingenuity to no adequate end.”

The chief aim of the new professor was to impress on his audience a sense of the nobleness of art, and the high purposes to which alone it ought to be dedicated. With his own pencil he endeavored to obey his own maxims, and the subjects which he painted were all in their nature poetical. Neither the advice of friends, the taunts of enemies, nor the offers of the wealthy, could induce him to descend farther down the scale of art. Like some of the old preachers, who, in their fierce sermons, ordered the profane, and those who were not chosen, to rise and depart, he dismissed from his lecture-room all students with sordid minds, who looked upon art as the way to gain—and who had none of the fervor of natural genius. On those who made mere fac-similes of human life, or who painted new-mown meadows, or well-fed oxen, he had little mercy. He asserted in conversation, if not in lectures, that the Royal Academy robbed the plough and the shoemaker’s stall of very meritorious persons,

and that many came to the sculptor’s chisel, and the painter’s pencil, who might have handled the joiner’s plane or the tailor’s scissors with greater advantage to the public and profit to themselves.

To support his theory of Invention, he was ready with illustration from ancient lore and the stores of an inexhaustible imagination. On one occasion he introduced the following happy quotation from Quintilian:—“We give,” says that eminent Roman, “the name of visions to what the Greeks call phantasies: that power by which the images of ancient things are represented by the mind with the energy of objects moving before our eyes: he who conceives these rightly will be a master of passions; his is that well-tempered fancy which can imagine things, voices, acts, as they really exist—a power, perhaps, in a great measure, dependent on our will. For if those images so pursue us when our minds are in a state of rest, or fondly fed by hope, or in a kind of waking dream; that are seen to travel, to sail, to fight, to harangue in public, or dispose of riches we possess not, and all this with an air of reality, why should we not turn to account this view of the mind? Suppose I am to plead the case of a murdered man, why should not every supposable circumstance of the act float before my eyes? Shall I not see the murderer, unawares, rush in upon him—in vain he tries to escape—see how pale he turns—hear you not his shrieks—his entreaties?—do you not see him flying, struck, falling? Will not his blood, his ashy semblance, his groans, his last expiring gasp, seize on every mind?”

“By this radiant recollection of associated ideas,” continues Fuseli, “the spontaneous ebullitions of nature, selected by observation, treasured by memory, classed by sensibility and judgment, Shakspeare became the supreme master of passions and the ruler of our hearts: this imbodyed his Falstaff and his Shylock—Hamlet and Lear—Juliet and Rosalind. By this power he saw Warwick uncover the corpse of Gloucester and swear to his assassination and his tugs for life: by this he made Banquo see the Weird Sisters bubble up from earth, and in their own air vanish: this is the hand that struck upon the bell when Macbeth’s drink was ready, and from her chamber pushed his dreaming wife once

more to *methodize* the murder of her guest:—and this was the power of Theon; such the unpremeditated conception which inspired him with the idea of that warrior, who, in the words of Elian, seemed to embody the terrible graces and the enthusiastic furor of the god of war. Impetuous he rushed onward to oppose the sudden incursions of the enemies—with shield thrown forward and high brandished falchion, his step, as he swept on, seemed to devour the ground; his eye flashed defiance—you fancied to hear his voice—his looks denounce perdition and slaughter without mercy. His figure, single, and without other accompaniments of war than what the havock of the distance showed Theon deemed sufficient to answer the impression he intended to make on those whom he had selected to inspect it. He kept it covered, till a trumpet, after a prelude of martial symphonies, at once by his command blew with an invigorated fierceness a signal attack—the curtain dropped—the terrific figure appeared to start from the canvass, and irresistibly assailed the astonished eyes of the assembly.”

Not the least valuable parts of Fuseli's lectures are those in which he, for the illustration of his own opinions, describes and compares particular works of the great masters. The Lecture on *Expression* (published in 1820) is especially rich in passages of this kind, nor perhaps has Vasari himself surpassed, even in his famous description of Giorgione's St. Mark, the effect produced by the style of Fuseli in treating of the Samson of Rembrandt, as contrasted with that of Julio Romano. The reader will not quarrel with the length of the following quotation.

“The gradations of expression within, close to, and beyond its limits, cannot perhaps be elucidated with greater perspicuity than by comparison; and the different moments which Julio Romano, Vandyke, and Rembrandt have selected to represent the subject of Samson betrayed by Delilah, offers one of the fairest specimens furnished by art. Considering it as a drama, we may say that Julio forms the plot, Vandyke unravels it, and Rembrandt shows the extreme of the catastrophe.

“In the composition of Julio, Samson, plunged into sleep, and stretched on the ground, rests his head and presses with his

arm the thigh of Delilah on one side, while on the other a nimble minion, busily but with timorous caution, fingers and clips his locks: such is his fear, that, to be firm, he rests one knee on a footstool tremblingly watching the sleeper, and ready to escape at his least motion. Delilah, seated between both, fixed by the weight of Samson, warily turns her head towards a troop of warriors in the back ground; with the left arm stretched out she beckons their leader, with the finger of the right hand she presses her lip to enjoin silence and noiseless approach. The Herculean make and lion port of Samson, his perturbed though ponderous sleep, the quivering agility of the curled favorite employed, the harlot graces and meretricious elegance, contrasted by equal firmness and sense of danger, in Delilah, the attitude and look of the grim veteran who heads the ambush, while they give us the clew to all that followed, keep us in anxious suspense—we palpitate in breathless expectation: this is the plot.

“The terrors which Julio made us forbode, Vandyke summons to our eyes. The mysterious lock is cut; the dreaded victim is roused from the lap of the harlot-priestess. Starting unconscious of his departed power, he attempted to spring forward, and with one effort of his mighty breast and expanded arms to dash his foes to the ground and fling the alarmed traitress from him—in vain; shorn of his strength, he is borne down by the weight of the mailed chief that throws himself upon him, and overpowered by a throng of infuriate satellites. But though overpowered, less aghast than indignant, his eye flashes reproach on the perfidious female whose wheedling caresses drew the fatal secret from his breast; the plot is unfolded, and what succeeds, too horrible for the sense, is left to fancy to brood upon, or drop it.

“This moment of horror the gigantic but barbarous genius of Rembrandt chose, and, without a metaphor, *executed* a subject, which humanity, judgment, and taste taught his rivals only to *treat*; he displays a scene which no eye but that of Domitian or Nero could wish or bear to see. Samson, stretched on the ground, is held by one Philistine under him, while another chains his right arm, and a third, clenching his

beard with one, drives a dagger into his eye with the other hand. The pain that blasts him, darts expression—from the contortions of the mouth and his gnashing teeth, to the crampy convulsions of the leg dashed high into the air. Some fiend-like features glare through the gloomy light which discovers Delilah, her work now done, sliding off, the shears in her left, the locks of Samson in her right hand. If her figure, elegant, attractive, such as Rembrandt never conceived before or after, deserves our wonder rather than our praise, no words can do justice to the expression that animates her face, and shows her less shrinking from the horrid scene, than exulting in being its cause. Such is the work, whose magic of color, tone, and *chiaro-scuro* irresistibly entrap the eye, while we detest the brutal choice of the moment.

“Let us, in conclusion, contrast the stern pathos of this scenery with the placid emotions of a milder subject, in the celebrated pictures which represent the Communion or Death of St. Jerome, by Agostino Caracci, and his scholar, Domenichino, that an altar-piece in the Certosa, near Bologna, this in the church of St. Girolamo della Carita at Rome; but for some time both exhibited in the gallery of the Louvre at Paris. What I have to say on the invention, expression, characters, tone, and color of either, is the result of observations lately made on both in that gallery, where then they were placed nearly opposite to each other.

“In each picture, St. Jerome, brought from his cell to receive the sacrament, is represented on his knees, supported by devout attendants; in each the officiating priest is in act of administering to the dying saint; the same clerical society fills the portico of the temple in both; in both the scene is witnessed from above by infant angels.

“The general opinion is in favor of the pupil; but if in the economy of the whole Domenichino surpasses his master, he appears to me greatly inferior both in the character and expression of the hero. Domenichino has represented Piety scarcely struggling with Decay, Agostino triumphant over all: his saint becomes in the place where he is a superior being, and is inspired by the approaching god: that of

Domenichino seems divided between resignation, mental and bodily imbecility, and desire. The saint of Agostino is a lion, that of Domenichino a lamb.

“In the sacerdotal figure administering the viaticum, Domenichino has less improved than corrected the unworthy choice of his master. The priest of Agostino is one of the *Frati Godenti* of Dante, before they received the infernal hood; a gross, fat, self-conceited, terrestrial feature, a countenance equally proof to elevation, pity, or thought. The priest of Domenichino is a minister of grace, stamped with the sacred humility that characterized his master, and penetrated by the function of which he is the instrument.

“We are more impressed with the graces of youth than the energies of manhood verging on age: in this respect, as well as that of contrast with the decrepitude of St. Jerome, the placid contemplative beauty of the young deacon on the foreground of Domenichino will probably please more than the poetic trance of the assistant friar with the lighted taper in the foreground of Agostino. This must, however, be observed, that as Domenichino thought proper to introduce supernatural witnesses of the ceremony in imitation of his master, their effect seems less ornamental and more interwoven with the plan, by being perceived by the actors themselves.

“If the attendant characters in the picture of Agostino are more numerous, and have on the whole furnished the hints of admission to those of Domenichino, this, with one exception, may be said to have used more propriety and judgment in the choice. Both have introduced a man with a turban, and opened a portico to characterize an Asiatic scene.

“With regard to composition, Domenichino undoubtedly gains the palm. The disposition on the whole he owes to his master, though he reversed it; but he has cleared it of that oppressive bustle, which rather involves and crowds the principal actors, in Agostino, than attends them. He spreads tranquillity with space, and repose without vacuity.

“With this corresponds the tone of the whole. The evening freshness of an oriental day tinges every part; the medium of Agostino partakes too much of the fumigated inside of a Catholic chapel.

"The draperies of both are characteristic and unite subordination with dignity, but their color is chosen with more judgment by Domenichino, the imbrowned gold and ample folds of the robe of the administering priest are more genial than the cold blue, white, and yellow on the priest of his master; in both, perhaps the white draperies on the foreground figures have too little strength for the central colors, but it is more perceived in Caracci than in Domenichino.

"The forms of the saint in Caracci are grander and more ideal than in the saint of Domenichino—some have even thought them too vigorous: both in my opinion, are in harmony with the emotion of the face and expression of either. The eagerness that animates the countenance of the one may be supposed to spread a momentary vigor over his frame. The mental dereliction of countenance in the other with equal propriety relaxes, and palsies, the limbs which depend on it.

"The color of Caracci's saints is much more characteristic of fleshy though nearly bloodless substance, than that chosen by his rival, which is withered, shrivelled, leathery in the lights, and earthy in the shade; but the head of the officiating priest in Domenichino, whether considered as a specimen of color independent of the rest, or as set off by it, for truth, tone, freshness, energy, is not only the best Domenichino ever painted, but perhaps the best that can be conceived."

During the brief peace of 1802 Fuseli visited Paris, and saw, in common with thousands of his adopted countrymen, the well-filled galleries of Napoleon. He remained there so long, that he collected materials for a dissertation on the subject, and on his return to London proceeded to arrange them. But the renewal of the war, or the apathy of his booksellers, discouraged him so effectually, that he discontinued these labors, and employed his talents on a new edition of Pilkington's Dictionary of Painters. This work, which appeared in 1834, added little to the reputation of Fuseli. He introduced indeed about two hundred new artists as candidates for fame; but most of them were strange to the world. It was a sufficient claim, he seems to have thought, to this

distinction that a painter had *tried* the historic style. On the other hand, he affected not to know the Christian name of Gainsborough all the world knew it was Thomas; he was grossly unjust also to that elegant artist's merits; nay, such was his haughty bigotry, that he classed the works of Hogarth among the daily vulgarities of common minds. His admiration of the eminent painters of historic or poetic compositions was strained and exaggerated, and his contempt for those who sought to win fame by humbler works was still more out of harmony with the ordinary views and feeling of his readers.

Having conceived an affection for the poetry of Gray—which, however, was confined chiefly to the translations—he painted *The Bard*, *The Descent of Odin*, and *The Fatal Sisters*. He was fond, indeed, of the wild mythology of the Scandinavians, and numerous traces of the impression which it had made on his mind might be pointed out in his paintings and in his sketches. His "Thor battering the Serpent" was such a favorite, that he presented it to the Royal Academy as his admission gift. With quiet beauty and serene grace he knew not well how to begin; the hurrying measures, the crowding epithets, and startling imagery of the northern poetry suited the intoxicated fancy of Fuseli. Such was his love of terrific subjects, that he was known among his brethren by the name of *Painter in ordinary to the Devil*, and he smiled when some one officiously told him of this, and said, "Ay! he has sat to me many times." Once, at Johnson the bookseller's table, one of the guests said, "Mr. Fuseli, I have purchased a picture of yours."—"Have you, sir; what is the subject?" "Subject? really, I don't know."—"That's odd; you must be a strange fellow to buy a picture without knowing the subject." "I bought it, sir, that's enough—I don't know what the *devil* it is."—"Perhaps it is the Devil," replied Fuseli, "I have often painted him." On this one of the company, to arrest a conversation which was growing warm, said "Fuseli, there is a member of your Academy who has strange looks—and he chooses as strange subjects as you do." "Sir," exclaimed the Professor, "he paints nothing but thieves and murderers,

and when he wants a model he looks in the glass."*

On the death of Wilton the sculptor, Fuseli became keeper of the Royal Academy—a situation which, due alike to his great merits and to his declining years, was not supposed to be unwelcome in a pecuniary point of view; it provided a pleasant residence and a respectable salary, and placed for ever above want one who, by his learning and the poetic character of his works, had done much honor to the Academy. A by-law obliged him to resign the Professorship, which he regained on the death of Opie, and thenceforth filled both situations with honor to himself and to the institution. The enthusiasm of his nature, his foreign pronunciation, the massy vigor of his language, and the sharp acidity of his wit, were not wasted on empty walls,—the lecture-room was commonly full.

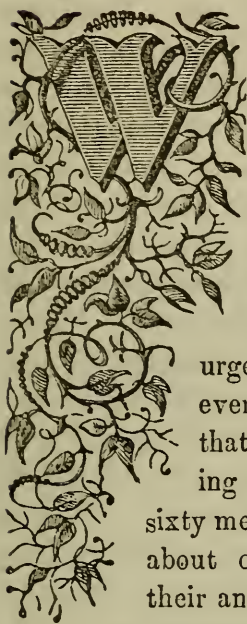
He was also, on the whole, liked as keeper. It is true that he was often satiric and severe on the students—that he defaced their drawings by corrections which, compared to their weak and trembling lines, seemed traced by a tar-mop, and that he called them tailors and bakers, and vowed that there was more genius in the *claw* of one of Michael Angelo's eagles than in all the *heads* with which the Academy was swarming. The youths on whom this tempest of invective fell smiled—and the keeper, pleased by submission, walked up to each easel—whispered a word of advice confidentially, and retired in peace to enjoy the company of his Homer, Michael Angelo, Dante, and Milton.

* I know not whether it be true that Fuseli himself supped on *raw pork*, by way of exciting his imagination, the night before he began his "*Nightmare*."

The students found a constant source of amusement in his oddities, his jests, and the strong biting wit which he had ever at their service. They are all fond of repeating his jokes. He heard a violent altercation in the studio one day, and inquired the cause. "It is only those fellows, the students, sir," said one of the porters. "Fellows!" exclaimed Fuseli, "I would have you know, sir, that those *fellows* may one day become academicians." The noise increased—he opened the door and burst in upon them, exclaiming, "You are a den of damned wild beasts, and I am your blasted keeper." The students laughed, and Fuseli, retired, smiling. Another time he was a figure from which the students were making drawings lying broken to pieces. "Now, who the devill has done this?"—"Mr. Medland, sir," said an officious probationer, "he jumped over the rail and broke it." He walked up to the offender—all listened for the storm. He calmly said, "Mr. Medland, you are fond of jumping—go to Sadler's Wells—it is the best academy in the world for improving agility." A student as he passed held up his drawing, and said, confidently, "Here, sir—I finished it without using a crumb of bread." "All the worst for your drawing," replied Fuseli, "buy a twopenny loaf and rub it out." "What do you see, sir?" he said, one day, to a student, who, with his pencil in his hand and his drawing before him, was gazing into vacancy. "Nothing, sir:" was the answer. "Nothing, young man!" said the keeper, emphatically; "then I tell you that you ought to *see something*—you ought to see distinctly the true image of what you are trying to draw. I see the vision of all I paint—and I wish to heaven I could paint up to what I see."

TO BE CONTINUED.

GOSSIP.



WE have been requested to call attention to the fact, that the New York State Daguerre Association, holds its next annual meeting in the city of Utica, on the second Tuesday in October next, and to urge the attendance of every member. It is stated that there are now belonging to the Association, over sixty members. Of these only about one fourth have paid their annual dues for the current year and it is hoped that all those who are still in arrears will pay up on or before that day. That this Association has made stronger exertions for the elevation of the Photographic art in America than any other, we need not assert, for the very fact of its having kept together, no matter how small the number who have been present at its meetings, shows a determination to persevere, that should be met by every daguerreotypist who desires its welfare and prosperity.

The daguerreotypists of America have so long heard their praises sung, and so long been tickled with the assertion of their superiority in the art, that they seem to think that there is no possibility of their ever being surpassed. Their bumps of self-esteem, and their egotistic self commendations have so led them astray, that they verily believe that mere mechanical skill is the all sufficient excellence to which their art is capable of attaining, and indeed, with a few exceptions, this is about the height to which their talents have raised them. Of the many thousands of daguerreotypes sent forth from the galleries of

even our best artists, how few can boast of artistic beauty, or artistic conception. In this branch of the art the Americans are far behind the first class artists of Europe, and if all we are told by Americans who have visited Europe during the last six months is true—and the characters of our informants leave us no room to doubt them—we shall not even have the satisfaction of boasting of superior mechanical skill, in a very short time.

It is absolutely necessary for our photographers to cultivate a more refined taste if they desire to retain their ascendancy, and there is no surer method of doing this than by occasional, or frequent assemblies, where interchange of thought and opinions are freely made, and where the elegancies of life, refinement of tastes, the beauties of nature, and the promulgation of inventions and discoveries are freely discussed.

God never intended that man, under any circumstance or place should be an isolated being—nature and nature's laws teach us that by concert of action all events are compassed; without this concert of action nothing grand or imposing, nothing useful, or valuable, can be accomplished. This axiom is as correct in mental philosophy, as in physical science, and physical action. The ideas of one man, instil others into the mind of another, these are multiplied by a third, a fourth elaborates those of the third and improves and increases them. Thus they progress, gaining strength as they proceed until at last the world is astonished and electrified by some great, or pleasing discovery.

Who can gainsay this reasoning. We have only to review the history of the many great inventions of the past centuries to fix indelibly the simple fact firmly in our minds and why should we doubt this power

of the human mind, to be expanded by its own volition, if we may be allowed the term, when we are taught to know that minute things are capable of suggesting great things? Do we not owe to the tea-kettle, the palace like vessels, which carry us so gently and nobly along our majestic rivers, or over the broad ocean? Are we not indebted to the kite of Franklin for that useful invention, the lightening rod? and to come nearer home, to our subject, are we not indebted to the changeable effects of the salt of silver in the production of the Diorama's of Daguerre, for the beautiful art of photography? And what would have become of all these grand suggestions, confined within the bosom of one man? Where would have been the perfections they now present? Oh! it is not in the secret recesses of one mind, that "form and pressure" can be given to any one substance, or idea, no matter how brilliant that mind may be. No, concert of action between mind and mind can alone pursue to a successful termination any great scheme. It is this truth that has always prompted our remarks, in regard to the Hillo-type and other great discoveries in the art. Its elevation as a science, as an art is all we desire, is all we strive for; it causes us to expend hour after hour of midnight toil, and it is a source of grief, mortification and irritability to us, to see daguerreotypists themselves so insensible to its welfare and that of themselves.

We do most sincerely hope, that the daguerreotypers of New York will not let the coming opportunity pass of evincing, at least a slight indication of interest in the work of regeneration; and that the October meeting of the State Society, will be fully attended. Do give it a fair trial, and do not let our trans-atlantic brethren surpass us in every good work.

The majority of our daguerreotypists are so completely ignorant of the daily occur-

rences in photographic art, that they cannot realize the necessity of greater personal application to the improvement and advancement of their art. They even laugh at the idea, that paper photographs can ever equal the daguerreotype. For men professing to know every thing regarding their art, they are the most ignorant set of bipeds of the true principles of that art that ever walked. They imagine that the few specimens of paper pictures that they have casually seen are the highest points to which that art can attain, forgetting that it is now only just where the daguerreotype was ten years ago. No, we are mistaken here, it has arrived at greater perfection. We have seen, we have in our possession, photographs that for beauty of execution and minuteness of detail, far surpass any thing that can be produced by the daguerreotype. It is true, the manipulation is involved in more mystery and difficulty, than that of the daguerreotype, and the execution requires a more delicate combination of mechanical skill, scientific research, and natural taste and talent: it may also, in a majority of cases, require more than one mind to carry out the process with determined success, still this does not detract from its excellencies or its superiority.

The daguerreotype, when hung to the wall in its gilt or rosewood frame possesses no superior quality in comparison with the paper photograph under the same circumstances: therefore it must eventually give place, as a parlor ornament to the latter. Enlarge the daguerreotype above that of the 9x11 inch size and it becomes coarse and unsightly, whereas the paper photograph is improved in its details, its sharpness, and its beauty; and does not deteriorate in softness of tints or brilliancy of tone. These qualities must gain for it the preference of all men of refinement and artistic taste over the

daguerreotype, while the ease and rapidity with which proofs can be multiplied for illustrating works of science, art and amusement, will make it of increased value to the public at large.

For portraiture it is another thing. The daguerreotype will always be the cheapest, and therefore, the most popular, and consequently, a few years will see it entirely in the hands of the less artistic portion of daguerreotypists, while the paper portraits will be confined to the men of taste, elegance and wealth. To the elevation, as an art, of the photographic processes we must look close to the improvement of the paper department, not, however, to the neglect of the silver tablet, for on this we must in a greater measure depend for the improvement of taste in the public mind.

If any one wishes to be convinced of the truth of these remarks we shall be most happy to show him specimens of the photographic art on paper that must disabuse any candid mind of all the false notions it may have imbibed on the subject.

We have lately received a few most exquisite views and landscapes from London—and shall be in receipt of others in a few weeks—which evince very rapid improvement in the art, and which if it continues for the next two years at the same ratio must throw the daguerreotype completely in the shade in every artistic particular.

Is it not necessary, therefore, that our daguerreotypists of first respectability should consult together upon the interests that concern them? Is it not necessary that they should be more united in the advancement of their art? Let it not be disgraced again, by such remarks as fell from certain daguerreotypist's lips, on the day previous to the opening of the Crystal Palace, when certain daguerreans endeavored to castodium upon a brother artist's work by offering, publicly, to bet that the results of his skill

were effected otherwise than by the regular daguerreotype manipulation. Such proceedings can only result to the disparagement of the individual who practices them, and is a tacit acknowledgment on his part of the inferiority of his own work, and we predict that the result will so prove it.

—A host of daguerreotypists from all parts of our country have visited our city since our last, mostly for the purpose of placing their pictures in the World's Fair; of them and their productions we shall speak hereafter.

—The Crystal Palace opened, as announced, on the 15th of July. A goodly array of fine daguerreotypes graced the scene, but the number was comparatively small to what now adorn its walls; in fact nothing was complete within or without it.

—Our pleasant and accomplished friend Fitz Gibbon, of St. Louis, has become the purchaser of Vance's superb collection of California views. May his fine taste and just appreciation of art be amply rewarded.

—A new style of coloring having been introduced into New York by some of our daguerreotypists, and as considerable inquiry concerning it has been made, we give the simple process below. After putting on the color over the first coat of sizing, taking care not to let the color extend quite to the margins of the outlines within the desired space of any particular color, a second coat of sizing may be spread. This process will beautifully blend the colors with the lights of the picture, and so completely secure it from injury that it may be severely rubbed or buffed. The second sizing should contain a small portion of gum arabic to give greater consistency to it. After the daguerreotype image is fixed with the gold

solution, and before drying, pour over it a weak solution of isinglass—1 gr. to the oz. of water; color the picture in the ordinary way, only a little more intense.

— Our illustration for the present number, is a fine crystalotype of the celebrated authoress of "Uncle Tom's Cabin," Mrs. Stow. The world wide reputation of this lady will, to many, make this number one of interest, while our motive is solely to present to our readers a specimen of the capability of the crystalotype to be employed in any kind of book illustration. We will again inform our subscribers, that we shall be pleased to receive daguerreotypes of any of our illustrious men or women, and of views of celebrated localities to be copied by the crystalotype as illustrations to the Journal, and which will be inserted free of expense, all we require being some brief account or description of the subject of the daguerreotype.

—The following communications to the Journal of the Photographic Society of London, possess sufficient interest to find a place here.

Replies to Queries addressed to

Sir W. J. Newton.

No. 1.—Respecting the use of *Common Soda and Powdered Alum*.

My motive for using *common soda* to cleanse the *negatives* is, that it not only removes the hyposulphite of soda more readily, but also any impurities which may be in the paper, as well as the *whole* of the *size*, this being absolutely necessary for the *after-waxing* process, which, when done, should make the negative appear nearly as transparent as glass.

The reason why I prefer *alum* for the positives is, that while it has the effect of removing the hyposulphite of soda and other impurities in the paper, it does not

act upon the *size*, which in this instance it is desirous to retain.

I have been induced to make a series of experiments with a view to prevent the *fading* of the *positives*, or, indeed, any portion becoming, as it were, *eaten away in parts*, and since I have adopted the foregoing, in no one instance has any change taken place whatever.

No. 2.—Respecting my motive for brushing the paper over with *Chloride of Barium* previously to iodizing.

In the first place, I find that it appears to give strength to the paper.

Secondly, that the action in the Camera is better and more certain.

Thirdly, it keeps clearer in the bringing-out process; thereby allowing a longer time for a more simple development.

Fourthly, I have never found any *solarizing* take place since I have used it (about three years).

And, fifthly, I find that it keeps longer and better after it is excited for the camera.

From the observations which I have made since I have used chloride of barium, I conclude that it has the effect of *destroying* any injurious properties which may be in the paper, and more especially with respect to the *size*, and besides which, when combined with iodide of silver, greater intensity is obtained in the negative.

I have occasionally prepared paper without chloride of barium, but I have always found (except for positives) that I could not rely upon it with the same degree of intensity. I need scarcely add, that throughout the whole of this process, the greatest care and attention is required, that the water should be constantly agitated while the paper is in it, and that the water should be changed once, at least.

WILLIAM J. NEWTON.

6 Argyle Street.

March 1853.

To the Editor of the Journal of the Photographic Society.

SIR,

In each of the processes addressed to *beginners* in photography by the two gentlemen above-named, there are one or

two omissions which I will take the liberty to point out.

The Count, in telling us how to iodize collodion, says, "In 1 oz. of collodion put a *little* iodide of silver." How many grains? This is a delicate operation, and minute particulars are necessary.

Which of his six formulæ does he consider the best?

On the next page (24), in the paragraph commencing "Pour the collodion," he says, in speaking of the nitrate of silver bath, "By adding a little alcohol to the solution, one part of alcohol to ten parts of water, and *one part of nitrate of silver*, the collodion is more speedily rendered sensitive, and the image produced is more vigorous."

By this description, I clearly understand that to every *ten* ounces of the nitrate solution, of which the bath is composed, I am to add *one* ounce of alcohol, but I do not at all comprehend *how much* nitrate of silver I am to add. *One part* with reference to *what*?

Sir William Newton mentions the use of hyposulphite of soda three several times, but in no one case does he give the *strength* required. Once, indeed, he says, "not strong," but that is evidently insufficient for *beginners*.

What papers does Sir William use for his *positives*? Not doubting, Sir, that these gentlemen, who have so liberally stood forward as teachers, will kindly complete their instructions by answering these few inquiries,

I have the honor to be,

Your obedient Servant,

IGNORAMUS.

1. 3 grains of iodide of potassium will dissolve about 7-10ths of a grain of iodide of silver.

2. If the second question could have been answered, only one formula would have been necessary.

3. The passage should run, "By adding a little alcohol to a solution" (of 1 part alcohol and 1 part nitrate of silver to 10 parts of water.)

4. With reference to the hyposulphite solution, Sir W. J. Newton recommends 1 oz. to half a pint of water.

5. Sir W. J. Newton informs us that he

procures his paper for positives at Woolley's, High Holborn.

To the Editor of the Journal of the Photographic Society.

SIR,

In an excellent practical paper which appeared in the 2nd number of the Journal, Count Montizon states that he considers "one of the principal objections to the collodion process, viz the necessity of carrying about large quantities of glass, is entirely got rid of" by transferring the film to paper. Now, to this method of mounting, it appears to me, several objections apply.

Laying aside its inapplicability to practice in the open air, or even supposing the difficulties of that situation overcome, and that the film, has been transferred and is fixed upon the paper, the advantage of portability is in my opinion, only gained at the sacrifice of that very property which renders a collodion so far superior to a paper negative, viz., its transparency, and all the objections to the paper, the mottled shadows and indistinct lines so disagreeable to an eye accustomed to collodion, exist in full force. I may remark, that when Mr. Archer first invented his process, it was thought that the operation of removing the film, so as to render only one glass plate necessary, was a great advance in point of simplicity upon all previous methods.

Experience, however, proved that although in that respect unrivalled, yet the practice did not lead to successful results; for it was found extremely difficult to free the plate, after a little use, from the hyposulphite, which adhered with such tenacity, that washing with water was quite ineffectual, and it was only by using strong sulphuric acid that the plate could be properly cleansed. Although this was obviated by temporarily fixing with salt and water, yet in the transference of the film, it is so liable to tear, or extraneous matters to get between it and the permanent glass, that the plan has been almost entirely abandoned by the most skillful operators. With small plates, with which I presume Count Montizon is accustomed to operate, the latter objections do not apply with such force as to plates 8 or 10 inches square, and upwards.

These remarks of course apply to negatives; the transferring the film of positives to dark paper, which I tried, does not however give good results.

I conceive, therefore, that an object so devoutly to be wished, as avoiding the necessity of carrying about glass plates, has not yet been accomplished. Apologizing for the length of my communication.

I remain Sir,

Your obedient Servant,
HUBERT SHELLEY.

Epsom, April 16 1853.

DAGUERRETYPE LIKENESSES.—We beg respectfully to call the attention of visitors and others generally, to the fact that we have in Montreal one of the most skilful and successful Daguerrian Artists in the world. This may seem somewhat hyperbolic, but we have had occasion to examine some of the very best productions in this line executed in London, Paris, New York, Boston, Philadelphia, and other great cities where first-rate artists are located, and we conscientiously aver, that we have seen nothing to excel the pictures which our own tip-top operator, viz., Mr. Doane, of the Place d'Armes, furnishes; and we think it only due to him that his merits should thus be properly recognised. We counsel our American friends when passing through Montreal, and our Western and other merchants, not to neglect while here the opportunity of getting a likeness true as the Sun, and as beautiful and artistic as a talented workman can render it.—*The Pilot*.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I

consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense. E. ANTHONY.





TRACHEE; OR BREATHING TUBES, OF THE SILK WORM.

Crystallotyped for the Photographic Art-Journal by J. A. WHIPPLE.

THE PHOTOGRAPHIC ART-JOURNAL.

Vol. 6.

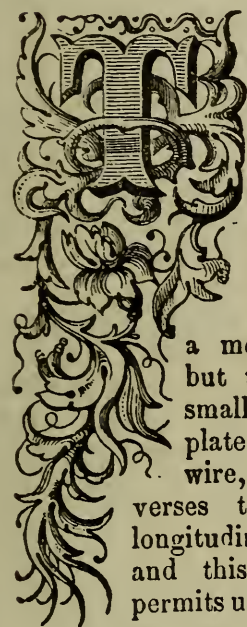
SEPTEMBER, 1853.

No. 3.

REMARKS IN RELATION TO PHOTOGRAPHY UPON METALLIC PLATES.*

From the French of Saint Germain-en-Laye, by J. R. Snelling, M. D.

POLISHING BLOCK.



THIS block is a small wooden apparatus the surface of which is a little less extensive than the silver plate, for which it is intended; we cover it with flannel thick and substantial, and adapt to each of its four corners a movable copper button; but they may be fixed by a small vice. It holds the plate by means of a copper

wire, which traverses the wood by a longitudinal opening, and this arrangement permits us to bring near or remove from the

corner of the block the button of which I have spoken. It ought to be so shaped as to cover the flattened corner of the silver plate which we slide beneath it. It serves at the same time to confine the plate and prevent the corner from tearing the buckskin or velvet.

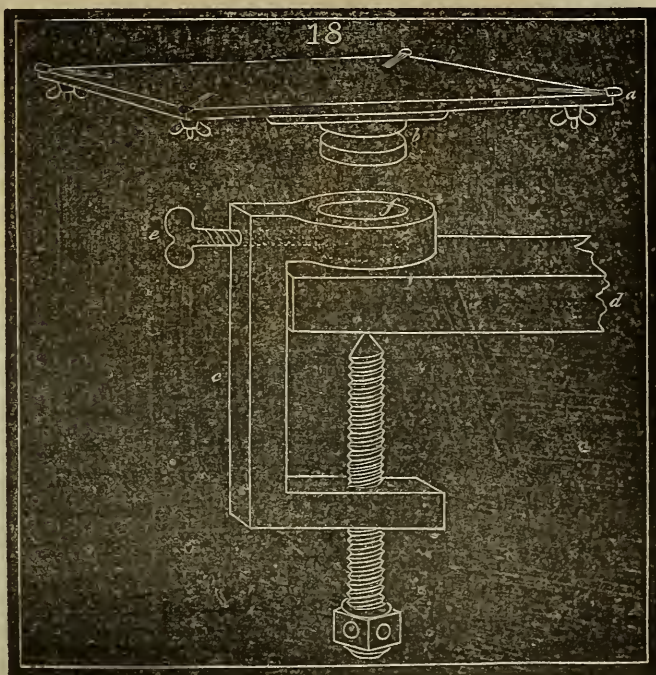
The block is fixed upon the edge of a table, by means of a small wooden or iron clamp which is attached by an appendix placed at the centre and below the block.

An improvement, the utility of which has been confirmed by experience, consists in being able to give to this small

apparatus, when it is already fixed by the clamp, a rotary movement horizontally upon its centre, in order to present its angles successively, when we desire it, to the action of the polishers, without deranging in any way the plate which is to be polished. Fig. 18 may give an accurate idea of what I wish to describe.

POLISHERS.

The polishers are long pieces of light wood being nearly 24 inches long by 3 wide, and 1 thick. They are furnished upon one of their sides with a handle similar to that of a large plane. The other side is furnished with thick flannel

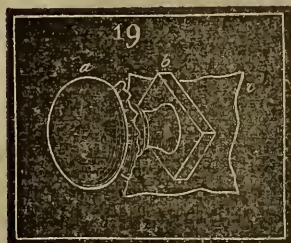


very pliant, upon which we put a sheet of fine paste board 1-8 inch thick, which covers it entirely, and over the whole of which we stretch tightly a piece of buck-

* Continued from page 111, vol. 6, No. 2.

skin or white cotton velvet, securing it by means of tacks in the edge of the polisher. It is well to have three: one covered with very thick velvet, and the two others with buckskin. If the buckskin polishers streak the plate, we might wear them off and soften them by means of very fine pumice stone, by which we shall have communicated an even surface by rubbing it upon a flat surface with a little sand or emery. We will thus carefully and uniformly rub over with the pumice stone the whole surface of the polisher, and clean it well with a hard brush to remove the remains of the pumice stone which might have adhered to it.

I make use also of small wooden *tampon* (fig. 19), terminated by a surface of



caoutchouc very strong and upon which I apply the small squares of cotton velvet, which ought to be nearly 8 centimetres across, in such a man-

ner that two of its opposite corners are folded against the handle of the tampon and this presses up under the fingers of the operator who keeps it in place by bearing upon it.

POLISHING POWDER

Pumice and rotten stone, both perfectly ground and dried after decanting, are, I think, the best powders which we can use. Photogene is also very good. In regard to tripoli, its molecules are sometimes agglomerated and it frequently streaks the plates. English rouge prepared like rotten stone, is indispensable for giving to the plate that deep dark brown without which it would not be possible to have fine proof. It is difficult to find very good rouge: that which I use, and which is of a superior quality was purchased at London.

It frequently adheres however to the plate, and spoils the beauty of the proof. It is necessary therefore, to employ it with discrimination, and not hesitate to repolish the plate with a little rotten stone, alcohol and cotton, if, viewed in the sun, it present even under the most perfect burnishing, a reddish brown appearance. We should then give the plate a final stroke with the buckskin polisher.

LIQUIDS USED FOR POLISHING PLATES.

If I have to polish a new or silvered plate the coat of which is very thick, or moreover, if I am obliged to efface a proof submitted to the chloride of gold, I make use of the pumice or rotten stone, with rectified oil of petroleum, to which is added 3 or 4 grammes of pure nitric acid, to every 100 grammes of oil which we wish to acidulate. We shake briskly from time to time these two liquids, which do not mix, because the acid being much heavier than the oil of petroleum, forms at the bottom of the bottle a very distinct coating. At the expiration of a few days, however, the oil, which was limpid, acquires a very decided golden color, and deposits reddish mucosities which frequently adhere to the sides of the bottle. Fifteen or twenty days afterwards we filter with paper, through which the oil acid easily passes: we employ the oil which swims and which is known to be acidulated as it reddens litmus paper.

For plates which I have not attacked as powerfully as those of which I come to speak, I make use of the same powders, wetted with alcohol into which I have mixed nearly one fifteenth part in volume of liquid ammonia, and a little less of sulphuric ether, or even, distilled water saturated with cream of tartar. Indeed, any process which will clean a silver surface as well as possible without streaking it, will always be excellent.

THE OBJECT GLASS.

The object glass constitutes the most essential part of photography, and there will never be any reason for bad proofs if we have a perfect object glass, that is to say which possesses, as much as possible at least, two qualities: a great luminous intensity, and an irreproachable clearness in the parts most distant from the centre of the image. Strictly speaking, this degree of merit has not been attained and a slight modification will be required, according to the use to which the object glass is to be applied. If it is for portraits, luminous intensity ought to prevail, because it is necessary to work with rapidity; if we wish to reproduce monuments, clearness will be preferable. As for the rest, nothing more will be required when the day arrives for giving to the coating of iodo-bromide of

silver, or to another substance, still to be discovered perhaps, a sensibility so exquisite, as a moderately livid light will answer for impressing it in an instant. We will reject, therefore all glasses with too short a focus, true magnifiers which, bringing together most of the luminous rays at a single point, necessarily deform all that which is a little removed.

At present, I am diligently engaged in reproducing sites, engravings or edifices only. I always operate on a large plate, and the object glasses with a long focus sent me from America or furnished at Paris, by Mr. Charles Chevalier, have invariably given me proofs of a remarkable clearness; I deem it my duty, to make this statement in justice to him. We have found also these proofs corrected with a prism or parallel glass, have been made frequently in eight and in four seconds, and this rapidity I had never obtained before in similar conditions.

We should overlook nothing, therefore, in selecting an object glass, and no trouble nor expense should be spared for procuring the most perfect one which we can possibly find.

CAMERA OBSCURA.

My camera obscura, similar to all those which are generally employed, but of a large size (being intended for normal plates), is furnished on the inside with cotton velvet, in such a manner that the small furrows from this material may be parallel to the axis of the luminous rays which proceed from the object glass to the ground glass. The absorption of light is more complete.

The circle of metal which surrounds the part of the object enclosed in the camera is masked by a little shield of pasteboard covered of the same nature. The inside of the brass tubes is also lined. All of these precautions which are not indispensable, contribute nevertheless to the success of the operator, because it prevents the reflections of light even the most feeble, from falling upon the sensitive coating.

The frame destined to enclose the holder which bears the metallic plate, and which receives the ground glass after the exposition, is grooved, and likewise lined with black velvet; not only to destroy luminous reflections, but to fix the

particles of dust which adhering to the sprigs of velvet, placed perpendicularly near each other like the hairs of a brush, are prevented from settling on the plate.

The standard of the camera obscura consists of three rods with two branches which folds in three pieces, and a strong neck with a movable ball, absolutely necessary in some localities for giving the apparatus a position favorable to the *ensemble* of the design.

MERCURY BOX.

I employ the necessary box generally in use at the present time, that in which the feet, fixed with copper springs, slides up along the lateral walls of this box when it is necessary to transport it, and reduces it to dimensions the most indispensable. It is the more convenient in my portable apparatus, because it is calculated to contain many of the pieces which compose it.

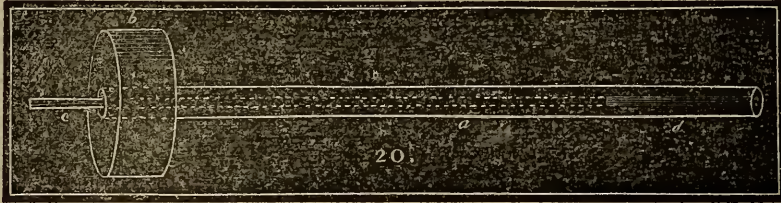
On removing from the camera obscura, the plate impressed by light it is put in the box at an angle of 45 degrees first recommend as absolutely necessary, but for a long time abandoned by a small number of persons. The able operator, Mr. Claudet, who certainly ought to be recognized as authority in the photographic art, places his proofs perpendicularly near each other, in the box of mercury in the same manner that we put our new plates in a grooved box. Some amateurs make use of a low iron basin, upon which they place the plate which is to be impregnated with vapor, parallel to the surface of mercury, and at very little distance 2 or 3 centimetres nearly, from it. These three different positions, perpendicular, parallel or diagonal to the surface of the liquid met all give very good results. We may therefore adopt for the mercury box the form which is best suited to the rest the apparatus.

I have in mine, near the thermomter and at as short a distance as possible from the surface of the mercury, a small opening 4 millimetres in diameter. Through this I introduce a glass tube, containing two or three drops of sulphuric ether, when the plate is exposed to the mercuriul vapor.

Figure 20 will give an exact idea of this tube. To one of its extremities is adjusted a cork which penetrates to the exterior edge of the box, when the tube shall be put in its place. A small piece of wood rounded

to a point, will shut the opening of the same side, in order that the vapor of ether may be confined in the box.

For want of a glass tube, we may use a piece of rolled paper, large enough to fit closely through the hole made in the mer-



cury box. We plunge the end of the roll of paper in the sulphuric ether, so that it is situated about at the centre of the basin. This paper must fill up so exactly that neither any air nor light can penetrate into the box.

PROCESSES EMPLOYED FOR OBTAINING A PROOF.—POLISHING.

A new plate covered with a coating of silver deposited upon it by means of the pile, must in the first place be submitted to the process of polishing and receive the most perfect burnish which it may be possible to give it. Two essential conditions ought to be obtained; it is necessary that the surface of silver should be as pure as possible, chemically and materially speaking, and that the burnishing which it receives should give it the aspect of the clear-stinned glass.

A daguerreian image ought to be considered as a design executed with a white pencil on a dark ground; because the reverse of an ordinary design, in which the lights and demi-tints are graduated by the crayon which blackens it on the contrary, and by reason of their intensity, the shades and *clair obscur*, it is the *dark* of the plate so to speak, which the white globules of mercurial vapor spare in the shades and demitints of the image in order to cling to, and whiten its luminous or reflected parts.

Such is at least up to the present time the most simple explanation which we can make of this mysterious and interesting phenomenon, notwithstanding the very curious experiments of Mr. Ed. Becquerel upon the action of glass continuators.

Although the polishing which the glass receives may determine the clearness and depth of black of the plate, the strict perfection of this polishing is one of the es-

sential conditions of the success of a proof.

The first thing to be attended to is to beat down the edges of the plate, in order to facilitate the action of the polishers upon the silvered surface. We employ for this purpose a burnisher, or a small machine quite ingenious which is found among opticians or daguerreotype manufactures. It is good for plates of small size; but as the pressure which it exerts is not instantaneous upon all the edges at the same time, as it is on the contrary progressive, going from one corner to the other, it follows that large plates submitted to its action are distorted, and it is almost impossible to restore them to their requisite evenness. I have made, to obviate this difficulty, a vice composed of a perpendicular blade of cast iron, which a balance lets down at will upon the edge of a plate likewise of cast iron, forming the base of the apparatus and horizontal to it. It is upon this last the plate is placed for the purpose of bending the edge. One of its borders projects a millimetre and a half through the whole of its extent, over that of the casting, and it is upon this border, which does not rest upon a support, that the perpendicular blade forcibly acts in its descent and bends it at a single stroke. Each of the four sides is submitted successively to the action of the balancer, and then received into a groove upon the horizontal plate, perpendicular to its surface. Several grooves, placed at distances according to the dimensions of the plates—for a half, third, fourth and sixth size—are made upon the base of the vice. Mr. Poirceir, Rue du Faubourg-Saint Denis, is the inventor of this excellent little machine.

The edges of the plate being bent down, the corners cut off with the nippers, and itself placed upon the polishing block, in

such a manner that its corners are covered by the copper buttons, we powder it well with pumice stone or pulverized rotten stone. These substances are contained in a small bottle with a large mouth closed by a metallic cloth. We take a pledget of very clean cotton which we soak in a little acidulated oil of petroleum, by placing it upon the mouth of the bottle which contains the oil and turning it upside down. We then rub the plate in every direction, describing at the same time small circles as intimately blended as possible. The surface of the plate is soon covered with quite a thick dark coating, which disappears little by little if we continue to rub sufficiently long with the same pledget, made double however by a new thickness of cotton suitable for the purpose; we continue thus to rub until the plate is almost dry, powder it anew and then polish it with one of those squares of velvet of which I have spoken, and which is placed upon the caoutchouc of the small wooden *tampon*. Rub it gently and in every direction until the silver takes a beautiful bluish black shade, so that the breath projected upon the plate does not render any spots visible—a sure indication that the oil has been completely removed.

If we perceived on the contrary any trace of grease, we would, recommence to polish with the same powders, using a new pledget of cotton and a mixture composed of alcohol, ammonia and sulphuric ether. The plate being dry, we take the large polisher furnished with white cotton velvet, after again sprinkling the powder upon it, and rub it lengthwise just the same as if we were using a joiners plane, but without bearing upon it too much, polishing successively in all directions, that is to say diagonally from corner to corner, or parallel to the two sides. At this degree of polish the plate will be covered with a white marbled film and if breathed upon not suffering any impurity to appear. We then take one of the buckskin polishers, well impregnated with English rouge, and under this movable pressure the plate is rapidly burnished. We always rub it lengthwise in every direction, and as soon as we perceive the surrounding objects are reflected with great clearness, upon all the burnished surface, we finish the polishing with a third buff also of buckskin, but upon which no

powder is put, and, we give the last strokes in a direction at right angle to the perpendicular of the proof which we wish to obtain.

We can likewise, (and I frequently employ this method) submit it to the action of large disks of light wood covered with chamois skin, mounted perpendicularly in the air or put in motion by a large isolated wheel. We thus obtained a perfect polish, and this method is generally adopted in the large establishment of London and the United States.

The horizontal plate block movable upon its axis, and represented by figure 18, singularly facilitates the polishing of plates, and I do not see that it is possible for me to recommend it too much to the amateurs of photography. They all know that the polish of the silver surface is produced by innumerable crooked or stright lines, crossing each other in a thousand ways in every direction, and that when the burnish obtained by means of the polishers is also as perfect as possible, these lines still appear and under the aspect of a bluish film, if we look at them at a certain angle. They are not perceptible if the luminous rays glide upon the plate parallel to them, but they appear if on the contrary these luminous rays strike at any angle, this is what we call the *sense* of the plate, and it is in order that the film may not appear that we always recommend to finish the polishing by some strokes given perpendicular to the top of the proof. All this does not exist by using the movable plate block, and we easily obtain with it a perfect burnish. You will operate with it in the following manner: Fix the iron vice at the corner of a table of a convenient height, but in such a manner as to have it between a window and the operator. By this means, the action of the polishers being always directed perpendicular to the window, the operator will be enabled to judge immediately the effect which each stroke of the buff produces upon the plate.

I resume here the polishing as soon as it is necessary to make use of the polisher of white cotton velvet and one of the dry powders; under its action the surface of the plate grows dark, and the crooked or crossed lines disappear gradually under those which are formed at this time, and, which being parallel to the luminous rays

which come from the window, are not seen in this position. We loosen then a little the steel screw which holds the plate block, and turn this upon its axis until the lines reappear and reproduce the bluish film; we fix it again and always repeat the operation in the same manner until this azure film becomes of a very uniform or homogeneous tone; but there is no use to think of causing its disappearance with the velvet polisher; it will always exist under an angle more or less acute.

We then take the buckskin polisher, impregnated with English rouge and repeat the operation as before, always bringing back upon the plate the bluish film after having made it completely disappear; but here at the first strokes we obtain a beautiful dark burnish, and when by turning the plate block, we restore the blue film, we find that it has already changed its aspect and become almost transparent. It is not however by the action of the rouge that it wholly disappears, but under the action of the clear buckskin the burnish will acquire all its beauty and neither film or lines will longer be perceived, whatever position we may give to the movable plate.

The polishing will then be perfect; but in this, as in all operations, success will depend upon the precautions, the industry, and knowledge with which it is conducted.

PREPARATION OF THE SENSITIVE COATING.

The plate being cleaned and burnished as described, we adapt it to one of the holders intended for receiving the ground glass after exposition. We remove carefully and by means of a fold of carded cotton, all particles of dust which might adhere to its surface. We remove the glass which covers the biscuit of the iodine box, and replace it by the holder which bears the plate. We compute time, and turn the plate end for end in twenty five seconds. The plate takes successively all the well known shades; the pale golden and orange yellow, brick red, red passing to rose, violet, steel blue, and finally green bright and clear, recovering then almost its former aspect of burnished silver to recommence another series—pale and golden yellow, etc., etc.

It is necessary to stop at the red shade passing to the rose, but it would be better to go a little beyond than stop short of this

shade. Calculate the number of seconds required for arriving at this tint. This time varies according to temperature perfection of polish or the relative quantity of vapor combined with silver. Indeed, the color must be taken into consideration, for it is the best guide to follow.

The plate being thus iodized, remove the glass which covers the biscuit of the box containing the chloro-bromide of lime; replace it, in the same manner as for the iodine, by the holder to which is adapted the plate already with the tinge of red passing to the rose. Its tone changes over this new substance, and when it has acquired a violet tint, still preserving however a slight rosy aspect, it is necessary to replace it over the iodine and leave it nearly two-thirds of the time that it remained in the first place. It will then become steel blue almost colorless, and present sometimes a faint greenish shade, which it is well to avoid.

I will here give figures to be considered as the mean time, but to which it is only necessarily of relative importance. First iodizing, 90 seconds; over the chloro-bromide of lime, 30; second iodizing, 1 minute.

These different operations ought to be made as much as possible, in the dark. It is not necessary therefore to examine the color which the plate takes except by means of the less lively reflections which may be cast upon it from a sheet of white paper or the ceiling of the room, and it is particularly essential to keep the plate from the light, even the most feeble, as soon as it shall be submitted to the second iodizing. No farther examination must then be made.

EXPERIMENT FOR PREPARING THE SENSITIVE COATING WITHOUT CONSULTING THE COLOR OF THE PLATES.

The sensibility of the coating which forms the plate depends, as we are aware, upon the relation existing between the silver, iodine and the accelerative substances which combine together; but none of these given substances are certain in this respect. How are we to measure moreover, or calculate at least the relative quantity of each of these substances, seeing that the tint which the plate acquires under their influence, and which is the only

index we may possibly consult, is often modified by the causes entirely independent of them, as for example, the polish of the plate, the purity of the silver, the state of the atmosphere the vapor or exhalations diffused in the place where we operate, etc., etc., and in the meantime a little more or a little less of iodine or bromine may admit of very different results—producing a very beautiful proof or preventing all trace of an image from appearing upon the plates. I have made this matter the subject of numerous experiments, and have fixed upon a method which I frequently employ and almost always with success, although it may still be very imperfect and insufficient to solve the problem which I have laid down for myself.

When the plate is well polished and ready to receive the fumes, I place it on the iodine box, the glass of which in a groove is replaced by a small apparatus of hard wood which covers the biscuit entirely, but which opens partially by drawing out; one after another, three strips which are each of the same length as the box, and in width, one-third only that of the box.

I pull out one of these strips and thus establish a direct communication between a third of the silvered plate and a third of the biscuit from which the fumes exhale. One third of the plate throughout its length immediately passes to a pale yellow, etc., while the rest of its surface does not change tone, and, in order to give here the figures, I will cite those of the last experiment made in the early part of December, 1849.

Fifty seconds after withdrawing the first strip, I remove the second; I then wait fifty seconds more before drawing out the third strip, and after again waiting fifty seconds, remove the plate with its holder and then in their frame. If in the state which it now is, I should observe this plate in the day time, it would present three longitudinal bands or strips of the same size, but of very different colors, since the first has been exposed to the iodine fumes 150 seconds, the second 100, and the third only 50.

Thus prepared, it is necessary to make the plate absorb the fumes of the chlorobromide of lime, and the ordinary box answers for this purpose. When the plate-

holder is put in its place, I pull out the ground glass in such a manner as not to open more than a third of the box, I let it remain thus partially open for 20 seconds, I then pull out the glass sufficient to uncover another third; I still calculate 20 seconds, and finally remove it entirely, again letting it remain 20 seconds before putting the plate and holder back in the frame.

Three new colored bands will be formed upon the plate during this operation; but they will be perpendicular with the first, and like them also of equal size and of very diverse tints, seeing that the first will have been exposed to the fumes of chlorobromide of lime 60 seconds, the second 40, and the third only 20 seconds. Finally, for the second iodizing, I leave the plate exposed as usual to the fumes of iodine 80 seconds. It is then ready to receive the luminous impression.

The plate now presents a surface divided into nine compartments of different shades upon each of which the sensitive coating has been formed by different combinations of silver, iodine, chlorine and bromine; now, it is evident that if I obtain a proof upon this plate, and this proof be more beautiful on one of these compartments than on the others, the combination forming this part of the sensitive coating will of course be most favorable for the photographic operation.

I would here say that an experiment of this kind must be in identical conditions, and it is necessary to reproduce a monument, for example, or even an engraving or a printed sheet of an even tone and uniformly clear. The experiment of which I speak has been made with a beautiful lithograph of a fantastical circle of Willis. Here are the results obtained.

First compartment, regarding it as the left side of the plate; first iodizing, 150 seconds; exposition to the chlorobromide, 60; second iodizing, 80 seconds. This second iodizing being the same for every compartment, I will not give the time again. Proof bad, black, without details, and veiled in shades.

Second; iodine, 100 seconds; bromine, 60; proof completely solarized.

Third; iodine, 50 seconds; bromine 60; proof not so bad as the preceding, but also overdone.

Fourth; iodine, 150 seconds; bromine, 40; *proof magnificent, of a remarkable vigor, and the lights brilliant.*

Fifth; at the middle of the plate; iodine, 100 seconds; bromine, 40; fine proof but slightly veiled.

Sixth; iodine 50; bromine 40; better than the preceding, but not so good as the fourth.

Seventh; iodine 150; bromine, 20; black, badly developed, very bad.

Eighth; iodine 100; bromine, 20; passable, but a little black.

Ninth; iodine, 50; bromine 20; second iodizing, 80 seconds, the same as the eight other compartments; but, although not quite to the same degree as the seventh.

We see here that there was a very marked difference between the image produced upon the fourth compartment and that which covered all the others. I have therefore prepared several plates by exposing them as upon the fourth compartment aforesaid, 150 seconds to the fumes of iodine, 40 to those of the chloro-bromide of lime, and 80 to the second iodizing, and I have obtained eight proofs in succession as fine as the image of the fourth department of the experiment.

These experiments are truly interesting; we may modify them in a thousand different ways; and thus arrive perhaps at some certainty in the combination of the substances which constitute the sensitive coating. It is remarkable that the best combination devised for morning, varies very little in the course of the day; but the next day the change is found to be much greater. It seems that another light, a different air, a change of temperature, require other proportions in the combination of substances; thus this fourth compartment, so remarkable for a few days, has given me nothing in the evening except an image almost dim, although I operated with the same proportions.

It will be observed also that the four worst proofs occupy the four corners of the plate, the 1st, 3rd, 7th and 9th compartments; and that that of the centre, the 5th, presents a fine proof but a little veiled; perhaps it would have been perfect if the exposition in the camera had been of shorter duration. We find there the effects of the object-glasses necessarily more luminous at the centre than upon the borders. It would

be necessary therefore, also to carry on these experiments under different luminous intensities, and there is still perhaps a field open to those successes, deceptions, unexpected results, and finally those emotions, which constitutes photography one of the attractive occupations which can be found.

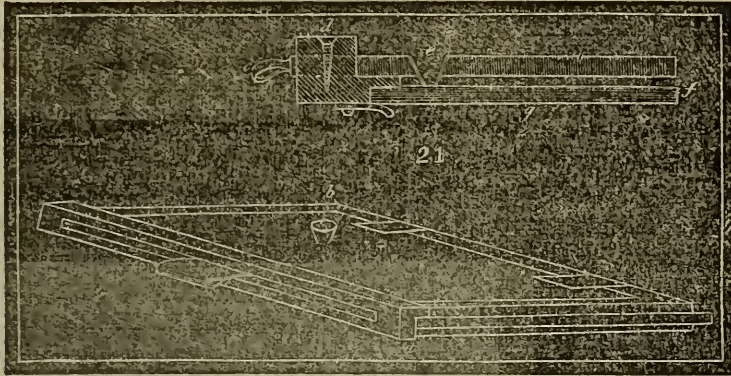
METHOD OF JUDGING EASILY THE COLOR OF THE PLATE.

A very simple modification communicated to one of my frames enables me to examine the color of the plates during all the phases of their transformation, either by broad daylight or in the sun itself, if I wish, without the least inconvenience resulting. In order to obtain our object, a certain point of the plate must be sacrificed; but this point will be merely a circle nearly the size of a lens, and confined to one of the corners, which will be concealed by the frame work of the proof.

When I withdraw a plate from the box of mercury, it always has in one of its corners and very near its edges a small round spot 5 millimetres in diameter, very white or solarized, according as I have examined the color of the plate by a light more or less vivid. It is very plain that if a small opening be made in the groove of the frame, through which to judge of the shades produced by the iodine and bromine; yet it is necessary also that it should be made in such a manner as to present the least inconvenience. We pierce in the groove of the frame, which is intended exclusively for the examination of the plated figure (21), a hole 12 or 14 millimetres in diameter, and in a place which corresponds exactly with one of the corners of the plate. We then glue interior to this a small cone, of wood or pasteboard, the large opening of which shall be nearly 10 millimetres in diameter, and the small one 4 or 5 only. It is essential that the lower edges of the cone or the small end should touch the plate, in order that the light may not be admitted under them, and thus form an areola with the mercury, which spreads more or less over the proof. The upper edge of the cone will be perfectly level with the surface of the *conlisse* screwed to the frame, so as to be immovable. The interior of the small funnel will be painted white, in order that as much light as possible may be reflected upon the small

metallic surface laid bare. This part of the impressible plate which, from its position, will form the bottom of the cone,

may be examined near a window or in the open air with the greatest facility. By placing the frame between the light and a



piece of white paper which will reflect it into the same cone, we can judge the shades of this small surface just as well as if we could see the whole plate; for we must not lose sight of the fact that in boxes with biscuit the different tints acquired by a well polished plate are of a perfect uniformity, and that the small corner of the plate will be of an identical color with that of the surface.

Every operator knows how difficult it is to judge the vigor of tints produced by iodine or the accelerative substances, when we examine them in another part or place than where we are in the habit of preparing the sensitive coating. This very serious difficulty, especially for individuals who reproduce views and monuments, does not exist if we use this frame with the small opening, since by viewing it in a full light it is always presented in the same circumstances. It is necessary to have a frame adapted for each size of plate.

POSITION TO GIVE THE CAMERA WHEN WE WISH TO REPRODUCE A VIEW OR A MONUMENT.

A recent experiment, the advantage of which is well established in my mind, induces me to call the attention of amateurs, particularly to the position to give the camera, when they wish to reproduce a view or a monument, a position subordinate to localities; but which must be attained as near as possible.

The best position for obtaining a clear and vigorous proof, is to place upon the same right line with the sun, the camera obscure and the monument to be reproduced, the camera being of necessity

between the sun and the monument; but if this position is the most favorable for the photographic action, it is not the best in regard to the effect of light, since all of the structure being drowned in the rays which pass directly from the spectator to the monument, its shades will not be visible, and there cannot therefore be in the design any of those contrasts, and piquant effects, which gives even the least picturesque sites their enchantment. It will consequently be necessary to choose a medium course and place it, if we can, so that the sun shall deviate from 50 to 60 degrees from this straight line, either to one side or the other. I would urgently recommend, in this case, as always, to turn the camera in such a manner that the parallel glass or prism shall present their reflecting surface from the side opposite the point of the horizon where the sun may be situated. If this be in the East, for instance, it will be necessary to point the tube of the object glass towards the East, in order that the surface of the prism may be turned towards the West.

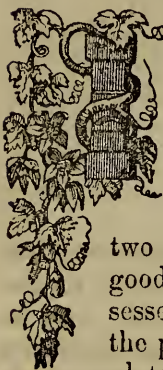
There is one general rule, finally, which must never be lost sight of. Every time the reflecting surface is placed in a manner to receive, even obliquely, the luminous rays which proceed from the sun, visible or not, the proof will be confused and more or less solarized on account of the intensity of these rays. It is necessary therefore, as much as possible at least, that the back or tinned side of the prism be turned towards the sun, whether it shines, or is covered with clouds, whether in fine, the apparatus is placed in the shade or even in an apartment.

To be Continued.

From the Journal of the Photographic Society.

STEREOSCOPIC PICTURES.

MR LATIMER CLARK, "ON AN ARRANGEMENT FOR TAKING STEREOSCOPIC PICTURES WITH A SINGLE CAMERA."

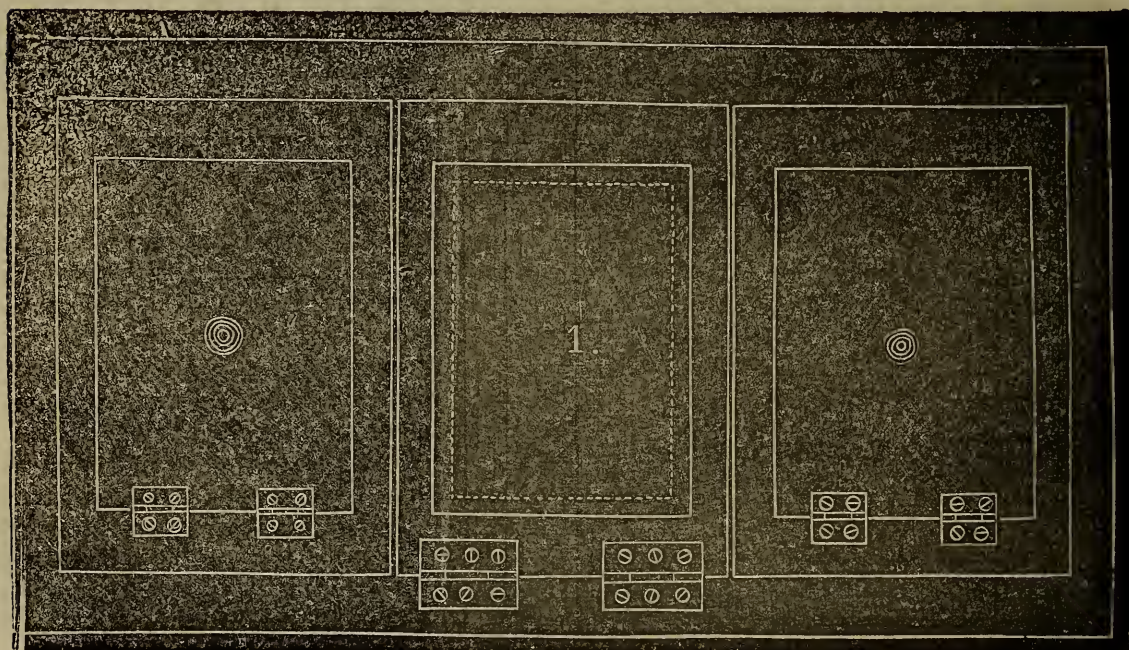


IN introducing this arrangement to the notice of the Society, I do not wish to represent it as calculated to supersede the ordinary method of taking stereoscopic pictures, viz. with two cameras, or even as being so good as that method; but it possesses a few important advantages; the pictures are produced on one plate and by one operation, with no more trouble than an ordinary portrait, and being both formed by the same lens and developed by the same solutions, they are almost sure to possess uniformity of size,

tone and intensity. Many amateurs too, already possessing one good lens and camera, will be glad to obtain stereoscopic portraits without incurring the expense and encumbrance of two others; lastly, they require no after-adjustment of position for the stereoscope.

The camera exhibited is adapted only to produce pictures of the size of those ordinarily purchased in the shops; the arrangement consists of two parts, viz. the camera frame, which contains the collodion or daguerreotype plate on which the images are successively impressed, and the contrivance for rapidly moving the camera laterally through the requisite arc without deranging the position of the image upon the ground-glass, or iodized plate.

The camera frame or plate-holder contains a narrow dark chamber of the usual



construction, capable of receiving a glass plate about 6 3/4 inches by 3 1/4; we will call this portion the *slide*; it slides to and fro freely within the frame through a space of 2 1/2 inches or 2 5/8, which is about the distance between the eyes; to admit of this the frame must necessarily be 10 or 11 inches long, and it therefore

requires some simple adaptation to fit it to the end of an ordinary-sized camera. In the front of the frame is an aperture about 2 1/2 inches square, closed by a sliding door, and capable of being contracted by an oval or other shaped diaphragm, which determines the size and form of the two pictures impressed on the plate, and which

may be varied at pleasure. The distance between the two pictures is determined by the lateral motion of the slide, viz. 2 5/8 inches, as stated before. After one of the two images has been impressed, the slide has to be shifted laterally at the same instant, and in the same direction as the camera itself, by means which I will pre-

the centre piece is the focusing-glass, which, being hinged at the bottom, does not slide, but falls back out of the way. The two side pieces (each of which is a perfect dark chamber containing a sensitive plate) are now in a position to be drawn successively into the field of view opposite the front aperture, and the images impressed. This

makes a very compact arrangement, and requires no door in front of the frame, the plates being exposed to light only when brought opposite to the central opening.

We now come to the means employed to guide the camera in its lateral movement, the object being all the while retained in focus. A strongly-framed camera-stand carries a flat table about 20 inches wide by 16, furnished with the usual adjustments.

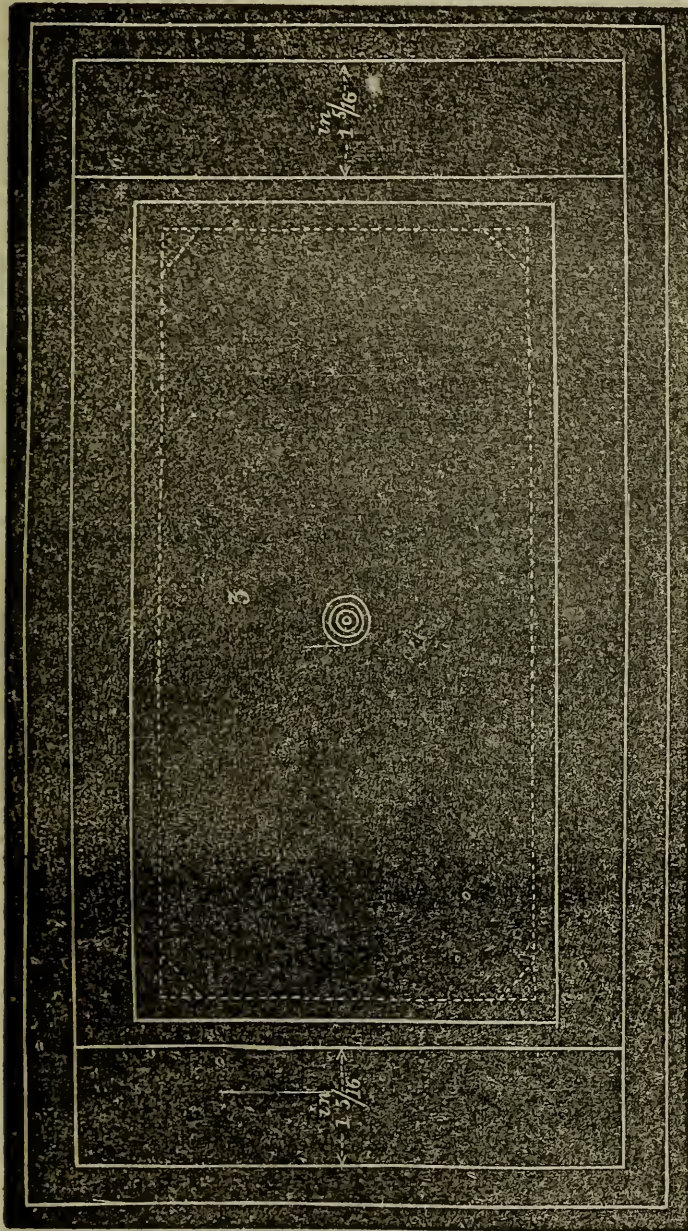
Upon this are laid two flat bars of wood, in the direction of the object and parallel, and about the width of the camera asunder; they are 18 inches in length; their front ends carry stout pins, which descend into the table and form centres upon which they turn; their opposite ends also carry similar pins, but these are directed upwards, and fit into two corresponding holes in the tail-board of the camera.

Now when the camera is placed upon these pins and moved to and fro laterally, the whole system exactly resembles the common parallel ruler; the two bars form the guides, and the camera, although capable of free lateral motion, always maintains a parallel position. In this condition of things it is only suited to take stereoscopic pictures of

sently describe. The second image is then taken, and the frame removed.

In the foregoing contrivance it is necessary to obtain the focus by a separate glass; but in the daguerreotype arrangement the focusing-glass forms part of the apparatus; the slide is here in three pieces;

an object at an infinite distance; but to make it move in an arc, converging on an object at any nearer distance, it is only necessary to make the two guide-bars approximate at their nearer end so as to converge slightly towards the object, and by a few trials some degree of convergence

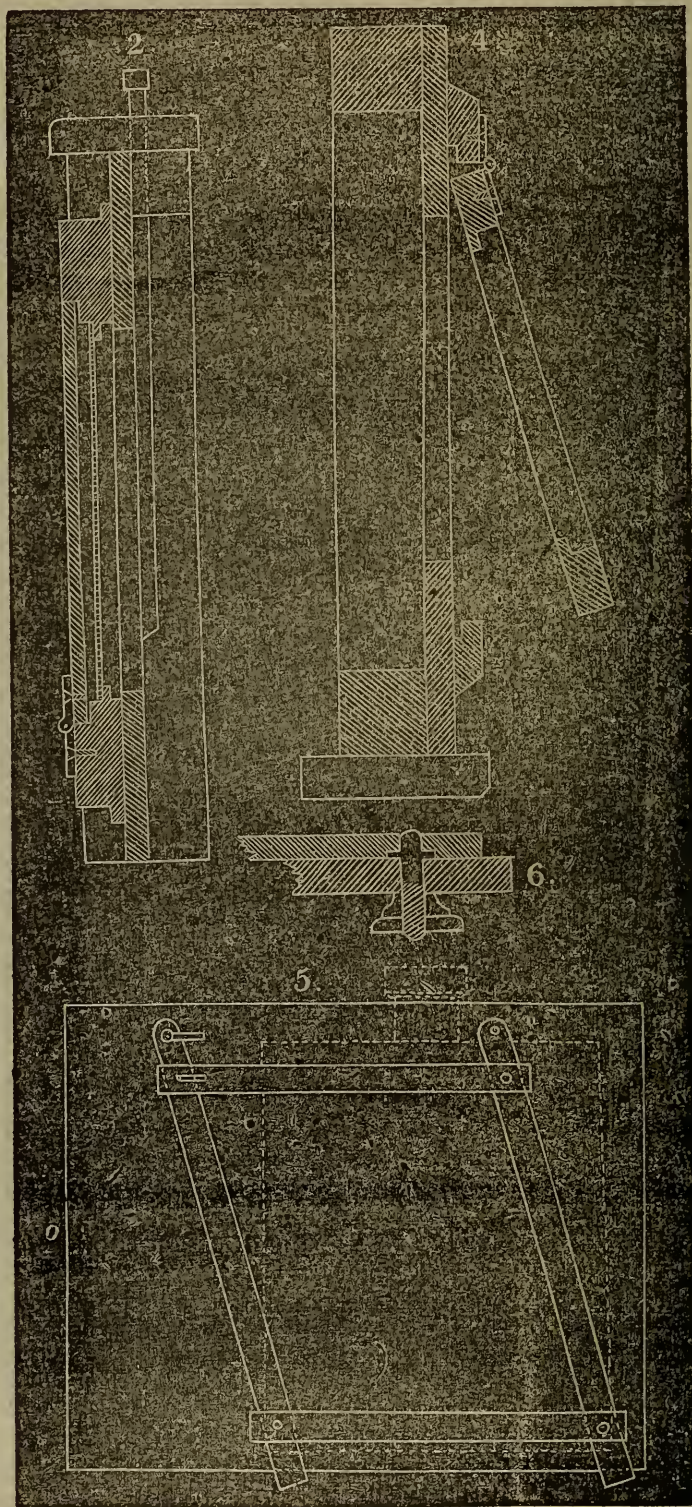


will be readily found at which the image will remain as it were fixed on the focusing-glass, while the camera is moved to and fro: to admit of this adjustment, one of the pins descends through a slot in the table and carries a clamping-screw, by means of which it is readily fixed in any required position. In order, however, to render the motion of the camera smoother, it is advisable not to place it directly upon the two guides, but to interpose two thin strips of wood lying across them at right angles beneath the front and back of the camera respectively (and which may be fixed to the camera, if preferred), and to dust the surfaces with powdered soap-stone or French chalk.

Lastly, it is necessary that the slide should be shifted laterally at the same instant as the camera. The means used for this are simple, and consist only of a pulley fixed to the right-hand side of the camera, round which passes a string which is temporarily attached to the slide, the other end being fixed to the left-hand side of the table. When the camera is drawn to the left hand, this string is long enough to allow the slide to be drawn to the left hand also; but when the camera is moved to the right, the reaction of the string draws the slide also over in the same direction, the variations in adjustment being compensated by the intervention of an elastic band.

The operation of taking a portrait is therefore thus performed. The focus having been adjusted for both positions, and the camera and the slide both drawn to the left hand, the door is raised and the plate exposed—say, for five seconds—by one motion of the hand; the camera is then shifted to the right hand, the slide moving at the same time spontaneously;

this occupies less than a second of time; and the plate in its new position having been exposed five seconds longer, the door is



closed, and the operation completed—the whole sitting having been supposed to occupy eleven seconds.

The portraits thus taken may be either

viewed as positives upon the glass, in which manner they form very pleasing portraits, or they may be transferred to paper; or, lastly, they may be transferred to another collodion plate, by direct superposition and exposure to daylight or gaslight; by this means a positive picture is obtained, which may be either viewed as a transparency, or backed with *white* varnish. The effect of this is good, and deserves greater attention than it has hitherto received.

With regard to the distance between the two positions of the camera, I know of no good reason why the natural distance of the eyes, viz. 2 1-2 inches, should be much exceeded. By moving the camera about four or five inches, a little extra relief is obtained without visible distortion; but if this distance be greatly exceeded, especially for near objects, they become apparently diminished in size, and have the appearance of models and dolls rather than of natural objects. I am aware, however, that there exists much difference of opinion on this subject.

(Mr. Clark, in conclusion, deprecated the custom of designating the two positions of the cameras by their subtended angles, instead of by their direct distances asunder; many persons who do not possess the means of measuring angles, having been thereby deterred from attempting to take stereoscopic portraits, although the process is exceedingly easy, and extreme nicety of adjustment, though highly desirable, is by no means indispensable.)

Description of Wood-Cuts.

(The first four figures are drawn to a scale of 6 inches to 1 foot.)

Fig. 1. Frame and slide for collodion portraits.

Fig. 2. Section of ditto, adapted to a camera, and containing a glass plate.

Fig. 3. Frame and slides for daguerre-type portraits.

Fig. 4. Section through centre of ditto.

Fig. 5. Plan of table and arrangement for shifting the camera.

Fig. 6. Section of clamping-screw for adjusting position of guide bars.

MR. CALVERT JONES, "ON A BINOCULAR CAMERA."

(The substance of a communication made to the Photographic Society, May 5th, 1853.)

Although the following paper does not

refer exactly to stereoscope cameras, I think the subject of sufficient importance to warrant my bringing it before the Society at this opportunity.

Having been, ever since the discovery of photography, an ardent follower of the beautiful art, I have long been convinced that the picture comprised in the field of view of an ordinary lens is not extensive enough, does not subtend an angle sufficiently large to satisfy our eyes; it is, in fact, analogous to what we see when we look out at nature with one eye shut.

To obviate this imperfection, I have been constantly in the habit of taking double pictures; *i. e.* having taken an upright view, I move the camera in a small arc till the left-hand side of the second view coincides with the right-hand side of the first.

Such views are, I believe, common enough, and I think that I can appeal to any person whether these kinds of pictures are not, when joined together and mounted, more satisfactory to the eye than any single view.

Of course I speak of general compositions, such as landscapes, architectural subjects, &c., and not of studies of any particular objects, such as figures, groups or still-life.

However, from the two portions of double pictures being taken on different pieces of paper, and the difficulty of making the edges meet with perfect accuracy, it appears to me a great desideratum that we should be enabled by some means to take the two views on one sheet of paper.

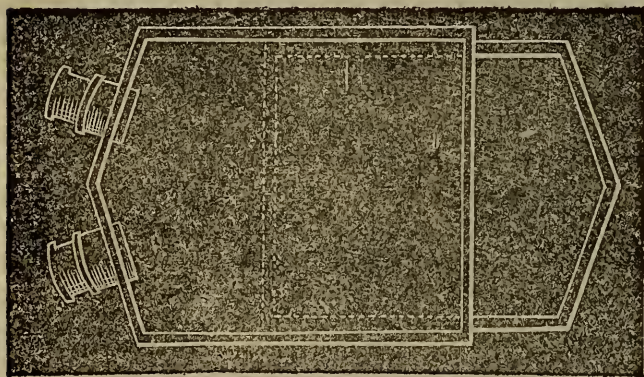
For this purpose, several plans have suggested themselves to me; such as rolling off the first portion of the view when it has been taken; and other devices which I have not found likely to be perfectly successful.

I cannot, however, help thinking that the desired end may possibly be effected by means of a binocular camera; first, taking one view with one lens, and having accurately covered the portion done, by a slide or trap-door, taking the remaining half with the second lens.

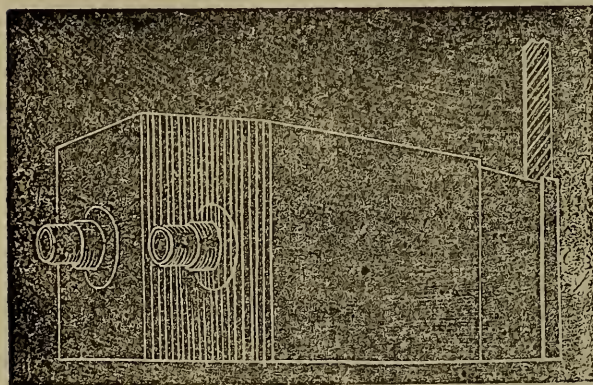
I subjoin a sketch of the kind of camera which I would propose to adopt for the above purpose; and throw out the idea to the manufacturers of these instruments, whether it may not be possible to construct

the paper-holders with such nicety as to attain the desired accuracy at the junction of the edges.

The size and beauty of the pictures would, I submit, amply repay the outlay of the two lenses required; and I can only add in conclusion, that though I am far from thinking it necessary to have such a camera for all views, I am of opinion that it would be a very useful appendage for taking a more perfect and satisfactory representation of many compositions in nature which cannot be adequately depicted by a single view.



The above is a section of the binocular camera, and the view below a rough idea of its appearance, with one slide up.



MR. HARDING (to whose opinion Mr. Calvert Jones appealed in the course of his explanations regarding the artistic merits of the double views obtained by his camera) said,—My attention was first called to the subject at Mr. Jones's house, where, to my astonishment he showed me these pictures; and that you may perfectly understand what is intended by them, I will suppose that we have two pictures—say, one a view taken up the river, the second one taken the other way, and beginning perhaps where the first leaves off. Thus, you ol-

serve, there will be two pictures taken of one view. These pictures afterwards are joined together, and the satisfaction to the eye, in a pictorial point of view, is hardly to be imagined. I was much struck with such specimens as Mr. Jones showed me, I saw clearly what he intended, viz. that when you take a picture in a camera with two lenses to it, you get twice as much as you see with one eye. Unless you had seen specimens of two views taken in this way and joined together, you would have no suspicion of anything but a binocular picture, such as you have been accustomed

to see where you have two views of the same spot held to both eyes; but in the way suggested by Mr. Jones, you have a view taken exactly as you see it with both eyes. I believe such gentlemen as are disposed to make experiments, will soon find out how perfectly true this is.

MR. SHADBOLT.—It appears to me that the camera exhibited by Mr. Clark has all the elements which are necessary for constructing views in the manner in which Mr. Jones has illustrated. It would merely require a modification of the sliding arrangement; for by adapting the parallel ruler apparatus to obtain the particular points, so that you would always have one view at the end of where the other begins, you can overcome the difficulty of joining, by using one piece of paper.

MR. CALVERT JONES.—I propose that it should be done on one piece of paper.

MR. SHADBOLT.—Your idea could be carried out by that very instrument.

“NOTE ON A NEW PORTABLE REFLECTING STEREOSCOPE,” BY C. WHEATSTONE, ESQ., F. R. S.

The most perfect and generally useful form of the Stereoscope is that with reflecting mirrors described in my earliest memoir “On Binocular Vision,” published in the Philosophical Transactions for 1838. Pictures of any size may be placed in it, at the proper point of sight, with the proper convergence of the optic axes, and it admits of every requisite adjustment to

make the pair of binocular pictures coincide correctly.

I have described in my second memoir a portable Stereoscope which folds into a small compass, and which is well suited for pictures not exceeding six inches by four. I have since constructed an instrument, very convenient for carrying about, which is adapted to exhibit pictures of the largest dimensions usually taken, as well as smaller ones, and which may be made use of either for mounted or unmounted pictures. When closed it occupies a space of 9 inches in length, 4 in breadth, and $4\frac{1}{2}$ in height; when expanded the instrument is two feet in length, 1 foot in height, and 9 inches in depth. The base and sides consist of jointed bars on the principle of the lazy-tongs; the two mirrors fold together back to back, and, by means of a hinge on their support, fall into a groove on the base fitted to receive them. On the top of each of the expanding sides a clip 9 inches in length receives the picture (which there is no need to mount on card-board) and holds it by the pressure of a suitably disposed spring; and a similar but detached spring clip is applied to the lower end of the picture in order to keep it flat and in a vertical position.

The pictures being fixed in the clips, so that their reflected images shall appear single and coincide in all their parts, the accurate adjustment to the sight of different persons is effected by sliding to and fro the pillar which supports the mirrors; the optic axes being caused to converge more as the mirrors are moved towards the eyes, and *vice versa*. As the height of the sides

is variable through every degree, the pictures are easily adjusted to the same level by pressing on the side which is highest. The length of the base being also variable, the pictures, if it be required, may be placed at different equal distances from the mirrors. If the pictures are not straight with respect to the sheets of paper on which they are placed, one end may be brought lower than the other merely by drawing down that end so that it shall not enter the clip so far as the other.

The instrument is furnished with a pair of ordinary spectacle lenses, No. 24. If the pictures were so placed that their reflected images coincided when the optic axes made an angle of 15° , corresponding to the distance of 12 inches, no lenses would be requisite, as the distance of the binocular image, the convergence of the optic axes, and the adaptation of the eyes to distinct vision would have their customary correspondence. But, for reasons I have elsewhere stated, a much better effect is produced, and the objects appear larger and more distant, when the pictures are so placed that, to cause their most distant corresponding points to coincide, the optic axes are parallel, or nearly so; in this case, however, in order to see the objects distinctly, the rays proceeding from them must be rendered less convergent, and for this purpose lenses are necessary.

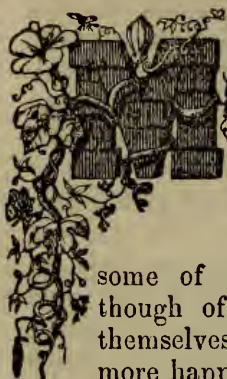
The lenses are movable in a vertical direction, in order that they may be fixed at the proper point of sight; the effect of a stereoscopic picture greatly depends on its being thus viewed, though it is a circumstance which is very generally disregarded.

FERRO-CYANATE OF POTASH.—The ferro cyanate of potash may be procured by digesting Prussian blue in liquor of potassa, until the alkali is neutralized, filtering to separate the peroxide of iron, and evaporating the fluid, when lemon-colored transparent four-sided tabular crystals, soluble in

less than their weight of water, perfectly neutral, inodorous, and having a slight bitter taste will be procured. When exposed to a temperature less than 212° F, each equivalent of the salt parts with 3 equivalents of water. A solution of this salt is used to fix the Ferrotypes.

COMMUNICATIONS.

MR. WHIPPLE'S EXPERIMENTS.



Y DEAR FRIEND SNEL-
LING:—As the art of pho-
tography is becoming of
more importance to the
world and daguerreotypists
are beginning to appreciate
its merits, I have thought
you might be interested in
some of my earliest experiments,
though of not much importance in
themselves, still interesting from the
more happy results to which they led.

It was 1844 that I first seriously turned my attention to photography on paper, and what leisure time I had from my ordinary daguerreotype business I spent (mostly in connection with W. B. Jones, a friend of mine) in trying the different processes then published, and devising means to improve upon them; finding the copying of the fibre or texture of the paper in the negative, upon the positive greatly marred their beauty, and could not be remedied by any means at command, and knowing that the basis of the whole thing, was the connection of nitrate, and iodide of silver with organic matter; the idea naturally suggested itself, why could not an even film of some kind, be laid upon mica and glass and the negative impression be taken upon that, thus avoiding the great evil of copying the texture of the paper: after thinking that it would be the best substance for that purpose, we finally concluded to try milk: accordingly one side of a clear piece of glass was wet with milk and then dried, it was then dipped in a solution of iodide of potassium, and afterwards in one of nitrate of silver, and exposed to the image of the camera; upon applying gallic acid, several parts of a picture made its appearance, to our great delight; a chimney, parts of two windows, and the outline of one side of the house, that the instrument was directed towards; all that did appear, was quite clear, and well defined: we afterwards found that it was the oily matter in the milk that prevented its operating only in spots: our next step was to destroy its oiliness; to accomplish it effectually was a

difficult matter, but we finally succeeded: first, letting all the cream rise, that would, then by adding sulphuric ether, and shaking thoroughly; after standing a while, the ether would rise to the top, the top containing all the oily matter in solution. By dissolving in milk thus prepared, iodide of potassium, and coating the glass with it, then dipping it in the aceto-nitrate solution, we obtained very fine results; in about treble the time of exposure necessary for the daguerreotype plate; but the greatest trouble, which we were now fully able to overcome was when removing the iodide from the hyposulphite solution, the picture was apt to be spoiled, but when we were so fortunate as to save one, we had not only a fine negative, but also a beautiful positive.

Not being able to operate to our mind with the milk, various other substances of a gelatinous and albuminous nature, were tried: but none operated so well as albumen from the hen's egg; it would hold the desired quantity of iodide of silver, and dry smooth, and would withstand the action of the hyposulphite of soda solution; two very important points gained; but in pictures made with it, there was a want of harmony, of light and shade; the deep shades and high lights coming in masses, the half tints, being most wholly wanting, so that for practical purposes it was very difficult.

These experiments were carried on with the greatest secrecy, known to only a few of our most intimate friends; which I am now convinced was very bad policy, for when Niepce's discovery of using albumenized glass was announced, it dashed all our hopes to the ground, for foreign countries; we filed a caveat, in the United States patent office, and experimented nearly the time allowed by such as do invent instruments and then applied for a patent, which after a long delay was granted. Shortly after on application a gentleman from Philadelphia applied for the same thing, but his application was rejected. Mr. Jones, who had an interest in the patent, has disposed of it to me.

The past two years Mr. J. W. Black has been engaged with me upon it, and I am free to say, that our recent discoveries,

and very much of the beauty it now possesses, is owing to the untiring efforts of this gentleman. The thing is now so far perfected, as to be eminently practicable, not only for views, but also for portraits, and a universal interest with the daguerrean fraternity is beginning to be awakened. To its advantages, it is my desire to place the price of a right within the means of all and be able to remunerate myself for the years of toil, and I do not say too much when I say thousands of dollars I have expended upon it, and I am firmly convinced that when the minds of our American photographic artists are once directed to this beautiful and interesting branch of picture making, that it will take a rank far before what the daguerreotype now is, its advantages are so vastly superior, its applications so much more numerous, that it cannot be otherwise; but all this has been dwelt upon by those who are so much better able to do the subject justice that I will say no more upon it.

For the illustration of the August number of your valuable Journal I send you a likeness of Harriet Beecher Stowe, taken from a daguerreotype made shortly before her departure for Europe, by G. W. Warren, of Lowell, Mass., an artist of more than usual merit, as a visit to his gallery of beautiful pictures will prove. This is probably the most pleasing daguerreotype likeness ever made of her.

Hoping that this hasty sketch of my earlier experiments and also the crystalotype pictures will prove acceptable, I remain your friend and well wisher,

JOHN A. WHIPPLE.

H. H. SNELLING, Esq.—Dear Sir,—As many members of our State Daguerrean Association will doubtless visit the exhibition at the Crystal Palace, they will look in vain for the frame of pictures which our Society voted should be placed on its walls.

And as some of them, particularly those residing in remote parts of the state, may be surprised at this, I feel called upon to make some explanation. With a view of presenting our result in a manner worthy of our art and of the occasion, as showing the degree of perfection attained by the photographers of the society, as well as of forming an object of beauty and attraction

among the many who would there displayed, it was decided by a vote that a highly ornamental frame should be constructed which should be filled by one specimen each of so many of the members as would contribute for that purpose.

Thus the cost would be divided among many, and the association properly and ably represented amid this crowd of gems.

According to instructions I had the frame prepared by one of the best frame makers in the state, and after applying for and receiving an allotment of space, sat down to await the arrival of the pictures by the appointed time. After waiting until the last moment before the opening of the exhibition, I found I had received only four pictures from three artists, with the promise of two more when the frame arrived in New York. Now, this for a frame calculated to contain not less than fifteen pictures, was utterly ridiculous. So, feeling bound to notify the authorities of the exhibition of the movement, I surrendered my right to the space which they had so kindly granted.

I have no doubt but that the New York city operators will have on the walls of the exhibition some splendid specimens of their art, but cannot but regret that the design of one general frame should have failed. If for no other purpose, it would have served to inform those interested, of the general skill of the operators throughout the state, a skill of which they are justly proud.

I regret this failure too, as an evidence of the weakness or decay of our society, which I fear unless a new interest is diffused, will soon cease to exist. This on many accounts is to be deprecated. I do therefore hope that those who have the greatest interest in its continuance will take the matter in hand before it is too late. The subject of a central collection or State gallery which has so long been a favorite scheme, is also based upon its existence; and the failure of this rises above private disappointment for it will be a public loss.

As for the frame I have taken it to my room where it forms a handsome though costly ornament.

In conclusion, let me suggest that you urge upon those who have been most active in the formation and guidance of the association the importance of taking such steps

as will tend to its re-invigoration and perpetuity.

Very respectfully, yours,

GEORGE N. BARNARD.

Oswego, N. Y., Aug. 1st, 1853.

THE COLLODION PROCESS.

To the Editor of the Journal of the Photographic Society.

SIR,—Will you allow me space in your Journal to describe my *modus operandi* with collodion on glass?

1st. To prepare the glass.—Roughen the surface of the edge about 1-16th of an inch all round with coarse emery paper; this prevents contraction of the film, and enables you to pump upon it, if necessary, without any fear of coming off.

2nd. To clean the glass if new.—Make a mixture of spirits of wine and liquor ammonia equal parts, render it as thick as cream with tripoli; with a piece of cotton wool, kept for this purpose, rub a small quantity over that side scratched as described, wash well under a tap of water, and wipe dry with a piece of old linen washed without soap, and kept scrupulously clean for this purpose.

N. B. To clean a glass after having used it, when not varnished, wash off the collodion film with water, and dry as above. Always wipe the glass just before use and breathe upon it; if clean, the moisture evaporates evenly.

3rd. Pour into the centre as much collodion as the glass will hold, and pour off at that corner diagonal to the one by which the glass is held: prevent the formation of lines, by altering quickly the position of the glass before the film drips; with observation and practice dexterity is easily acquired.

4th. As soon as the collodion ceases to run, plunge the prepared glass, without stopping, into the following bath:

Into a 20-oz. stoppered bottle put

Nitrate of silver.....1 ounce.

Distilled water.....16 ounces.

Dissolve.

Iodide of potassium.....5 grains.

Distilled water.....1 drachm.

Dissolve.

On mixing these two solutions a precipitate of iodide of silver is formed. Place the bottle containing this mixture in a saucepan of hot water, keep it on the hob for about twelve hours, shake it occasionally, now and then removing the stopper. The bath is now perfectly saturated with iodide of silver; when cold, filter through white filtering paper and add,

Alcohol.....2 drachms.

Sulphuric ether.....1 drachm.

5th. Allow the prepared glass to remain in th's bath eight or ten minutes; just before taking it out move it up and down three or four times; drain it, but not too closely; when in the frame place upon the back a piece of common blotting-paper to absorb moisture; the sooner it is placed in the camera the better.

6th. Time of exposure can only be ascertained by practice, no rules can be laid down, and I am unacquainted with any royal road but that of experience, leading to constant success in this most important link in Photography.

7th. The plate being taken from the camera and placed upon a levelled stand, develop immediately the latent image with the solution:—

Pyrogallie acid.....3 grains.

Distilled water.....1 ounce.

Acetic acid (glacial)....1 drachm.

Mix.

Take one part of this solution and two parts of distilled water for use. The pyrogallie solution made with proper acetic acid and of the above strength, may be kept for a month or more in a cool place away from the light.

8th. When the image is sufficiently intense, wash freely with common filtered water; then pour on a saturated solution of hyposulphite of soda, which should immediately remove the iodide of silver, wash again well with water; allow as much as the plate will hold to soak in for at least half an hour, to remove all traces of hyposulphite of soda; lastly, stand up to dry, and if required, varnish with amber varnish.

I am, Sir, yours &c.,

RICHARD W. THOMAS.

From the Journal of the Photographic Society.

ON A FOLDING CAMERA.

BY MR. KNIGHT.

[Read at the 3d Ordinary Meeting of the Photographic Society, April 7, 1853.]



THE form of Camera which I have the pleasure to bring before the notice of the Photographic Society this evening, I trust will be found to combine, in the same instrument, many important acquisitions, such as strength, firmness, and portability. The photographic cameras in general use, are of two sorts or varieties, viz. sliding and folding; there are other forms, such as the American, possessing advantages, but as these are confined in a great measure to the glass room of the photographic artist, I do not purpose to enter upon them this evening, my object being to describe one designed for, and which I hope will supply the wants of, the photographic tourist.

The sliding camera is a very convenient form of instrument when large pictures are not required; by means of a second opening, a considerable range of focus may be obtained; when large pictures, however, are required, it becomes necessary to enlarge the camera in proportion, and consequently it is rendered a very unwieldy instrument, requiring a light cart or wheel-barrow to remove it from place to place; for the tourist to be able to take it with him inside a railway carriage is out of the question. The folding form of camera possesses the advantages of portability; but has this inconvenience, that, not sliding, the only adjustment with which the lens must be provided, and this is necessarily very limited; and again, in a long camera it is very inconvenient to reach while engaged in focusing on the ground-glass. Another objection is, that when a portrait lens is required to be used, the second opening for the dark slides and focusing glass is obliged to be removed a considerable distance from the face of the operator; these inconveniences it has been my endeavor to remedy in the instrument submitted for your judgment

this evening. I do not put it forward as a perfect photographic camera, or one that will meet the views and wishes of all photographers; but it appears to me to remove many of the inconveniences I have pointed out in the simple sliding and folding forms; one objection which I fancy may be brought against it, viz. its costliness, I would simply answer by saying that I have endeavored in its construction to do away with all unnecessary work.

I will proceed to show you the camera: the one I have here this evening is adapted for Voigtlander's No. 3 lens, which can be used either in combination for portraits, or groups, or the front lens alone for views, taking pictures well defined to the extreme edge of 11 inches square.

The camera, and, if required, its tripod stand, packs away in a traveling portmanteau very convenient for transit by railway, as the photographic tourist may take it with him in the railway carriage.

The camera can be readily put together and taken down by one person.

I will now put it together.

1st. I take out the tripod stand and put it up.

2nd. I place on the stand the body of the camera, to which it is attached securely by means of a nut and screw, raise it and place on the front.

3rd. I open and slide on the back, and put in the set screws.

4th. I screw on the brass mounting; having previously secured into it the front lens of the combination, the camera is now ready for taking a view. The dark slides are double ones, each holding two sheets of prepared paper.

To adapt the camera for the lenses when used in combination,—

1st. I place my hand inside and turn back a small button and open the glass, place in the groove the slide, turn back the brass hooks, remove the front slide, and the front half of the camera will fall.

I now screw on the combination of lenses, having first returned the front lens: the

camera is now suited for taking portraits or groups from life.

To put away the camera I replace the

half portion, and turning down the brass hooks, remove the slide, and fold it all down together.

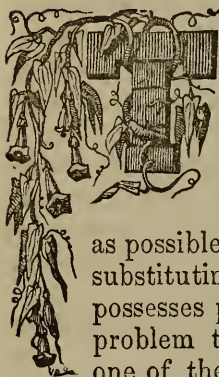
A GENERAL REVIEW OF THE DAGUERRETYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

SECTION XIV.

NEGATIVES ON ALBUMENIZED GLASS.



THE necessity which has been perceived from the commencement of rendering the paper of the negatives transparent, in order to be able to draw from them positives as accurate as possible, give rise to the method of substituting glass for paper, which possesses perfect transparency. The problem to resolve was then to cover one of the sides of the glass with a photogenic coating which should itself be transparent. M. Niepce de Saint Victor has perfectly succeeded by employing albumen.

This process gives negatives of marvellous delicacy, not to be surpassed by proofs on silver, if the coat of albumen has been perfectly smooth.

To prepare the albumen, collect a number of whites of eggs separated from their yellow, add to them 10 drops of concentrated solution of iodide of potassium for each egg, whip it to a froth with a wisp or silver fork; the iodide may be added in the salt state in the proportion of 9-10 of a grain to one egg. The iodide in solution seems to me preferable, because the albumen by the beating loses a portion of its water, and when it is necessary to spread it upon the glass it is often too thick.

It is useless to separate the seeds, whatever care be taken some will always remain, filtering will remove them much sooner. When the mixture has been transformed

into a froth of a certain consistence, it is left still protected from the dust. At the expiration of a few hours, a larger portion of the albumen has become liquified, and may then be used; but it is better ten or twelve hour after; it filters very well through paper, protecting the filter from evaporation.

This albumen may be preserved a number of days without losing its properties, it keeps eight or ten days without corrupting, it however loses its strength and becomes very liquid, and the production of the image becomes difficult.

The addition of a small quantity of honey of excellent quality is indispensable, if the albumen is to be employed the same day, it aids greatly in preventing flaws.

Before coating the glasses with the albumen, it is important that their surfaces be perfectly clean; they must be first wiped with linen suitable for this purpose, breathing on the surface, and then with a pellet of cotton and polishing powder, unpowdered pellets produce less dust, but they are not so sure.

When the glasses have been cleaned one after another, they are then to be covered with the albumen; the prior precaution has been taken to mark them with some sign by which the face may always be distinguished from the back, which may then only need a slight cleaning.

To cover a glass, especially if it is rather large, it will be well to fit it to a handle which may serve to move it in every direction without fear of falling. M. Renard has shown me a very convenient holder for this purpose; it is composed of a wooden

* Continued from page 73, vol. 6, No. 2.

block bearing three flat blades, set in square, two on one side, and the third on the other, and forming by their extreme points an isosceles triangle. These three screws have an edge covered with cork, and the point of meeting of the arm forming the apex of the triangle is moveable the whole length of a groove, and is held with a press screw, when the clews are loose, which allows the holder to be used for glasses of different sizes.

If it is a half size, it is easier to hold it in the hand. Whatever may be the method employed, a quantity of the albumen is to be poured from a lipped vessel very gently upon the centre of the glass, more than sufficient to cover it, and then immediately, but without haste, the glass is to be given a circular motion, inclining towards the different sides; by this means the coating of albumen is spread over the glass. To complete the equalization, I make use of a very straight glass tube, to which are attached two threads of the thickness to be given to the coat. These threads can slip through the tube so as to separate them a distance a little less than the width of the plate, by turning their knots above, so that by moving the tube slowly forward the coat becomes equalized at a single stroke.

The employment of this tube causes the albumen to flow over more and renders necessary the employment of a dish to receive it. When this operation is ended it only remains to place the glass in a horizontal position, after having dried its edges.

That the coat of albumen may be good, it is important, that it be dried *slowly*, which requires at least twelve hours, that is to say, heat and acid vapors to coagulate it should not be employed.

When the albumen has dried spontaneously, as I have just observed, the bath of aceto-nitrate thoroughly coagulates it.

Mr. Renard has had a very ingenious apparatus constructed, which allows him to dry fifteen or twenty plates of different dimensions at one time; perfectly horizontal, and out of the influence of the wind and dust.

It consists of a case covered all around with rose colored blotting paper. The upper and lower sides are provided with grooves in which work copper screws, wound from top to bottom, he ordinarily

employs five screws, two at each angle and one in the middle. The glasses lay upon corks, which are threaded by the screws and can move up and down by giving them a rotary movement, which forces them to follow the threads of the screws. By this disposition each glass lays on these corks, and after having made each horizontal separately, and taking note of their number, he can clean them and place them again in their place, with the certainty of their being horizontal. For greater convenience, he commences by making the upper side of the case horizontal, so that he can change its situation for a more favorable one, and, after removal, he deems it sufficient to level again the top of the case to assure himself that the plates are also horizontal.

Many writers advise to push the drying process till cracking; this is not prudent. I desired to assure myself of what might result from it; for this purpose I dried an albumenized plate until it became brilliant in the sun, through a multitude of small fissures; I went to the extreme, it is true, but also after the immersion in the aceto-nitrate the albumen curled up all over and ended by coming off in fragments. I repeat it, it is necessary that the drying be complete, and that the operation be performed as slowly as possible.

The plates thus prepared may be preserved a sufficient length of time out of the influence of dampness; it is more prudent however to use them as soon as possible, to prevent the small cavities which must often come upon them, without our knowing the reason wherefore.

To make them sensitive, they are to be immersed in a bath of aceto-nitrate of silver, either in a narrow dish of glass or gutta percha, or which is much better, by the aid of a vessel rather larger than the plate, at the corners of which on the bottom four small pieces of glass about 1-4 or 1-10 of an inch in thickness have been glued. The glass is placed on two of the supports, after having filled the dish with a sufficient quantity of the liquid as to perceptibly cover the four pieces of glass, and holding the glass by the centre of one of its edges, a reciprocating motion is given it, which gradually puts the bath without any interruption in contact with the coating of albumen.

This disposition has the advantage of allowing the foundation of the iodized pellicle to be clearly seen. M. Coeulte employs it successfully for collodion.

The plate remains immersed thus two or three minutes, it may be withdrawn and placed immediately without washing in the camera; but as sensitiveness with albumenized glass must not be obtained at the expense of perfection, it is better to rinse the plate with distilled water.

I desired to see what would result from a plate placed in the camera and submitted to the gallic acid without having rinsed it; the picture appeared very rapidly, and very well at first, but, towards the end, light traces of reduced silver were found upon it, which obscured the proof in certain portions.

These deposits being light, when the proof was fixed and well dried, I have polished it with oil and very fine powder of sulphur; by this means I have succeeded, operating with considerable management, in completely freeing the proof from this light veil. However little it may be suspected that a proof is veiled from this cause, it should undergo the same operation, which is without danger if performed gently. The proof is brought out with concentrated gallic acid filtered and warm; it is easier to immerse the plate in this liquid, because any delay in the operation is not attended by any disadvantage. The plate of glass is ordinarily placed in a dish containing gallic acid, holding it partly raised, and then lowering it immediately. Gradually the image appears; but if, at the expiration of five minutes, nothing is seen, it is needless to count upon it. However no risk can be run in leaving it several hours to form slowly. If, on the contrary, it manifests itself very rapidly, a strongly marked impression will be obtained, and it will be necessary to watch that it may not over step this point.

The silver coated basins are very convenient for this operation, as they may be heated, if needful, from beneath.

When the proof has reached the right tone, it is removed from the bath of gallic acid to rinse it plentifully with water and to place it for a few minutes in common water.

To fix it, the ordinary bath of hyposulphite is employed. The tone is almost

always a beautiful black; it is not necessary to replace it by contrivances which would cause the albumen to swell.

Sometimes this swelling takes place partially; and the proof appears lost, but with a little care, the blister disappears, though not without leaving some traces on drying.

These negatives well dried are ordinarily very solid. They are not varnished, in order to obtain all their delicacy on positive paper. A very light coat of varnish however would serve as a remedy for all blemishes that might arise.

Very old gallic acid, and of a brown color, is very good; it gave me excellent results.

If pyro-gallic is used for bringing out this picture, it should be employed on the dose of 18 grains to a pint of water and by pouring the desired quantity upon the plate again fixed.

It is well only to dissolve the quantity to be used during the day, as this substance colors very quickly, especially in warm weather. That which has already been used should be rejected; it is not so with the residuum of gallic acid, it may be used after filtering as a dissolvent of crystalized gallic acid.

It is very convenient to dissolve the gallic acid in alcohol, and to use this solution diluted with water. The solution, thus strongly charged with gallic acid, is not so good for bringing out the proof as the solution with water alone; but it gives to the negatives already formed, blacks of great intensity.

EMPLOYMENT OF THE RESIDUUMS.

Photography on paper cannot be practised without leaving deposits more or less charged with acetate of silver, which also deposits a black sediment composed in a great measure of reduced silver.

It is useful to pour all these waters into a large vase containing salted water, which will precipitate all the silver in the chloride state, and, finally, there will be a sediment composed of chloride, reduced silver and gallate of silver, which will serve in forming acetate of silver, fit for using afresh.

To again dissolve the silver, it will be sufficient to plunge into the residuums a plate of zinc, adding thereto a little diluted sulphuric acid. The hydrogen gas produced will in a few moments reduce the

chloride to silver very disunited in proportion to the reduction of the chloride, the disengagement of the hydrogen gas will be less perceptible, and when effervescence becomes manifest, it is a certain indication of the total reduction of the chloride; it will then be sufficient to remove the sheet of zinc and wash the deposit on a filter.

The silver thus reduced always contains a little zinc; but this is no disadvantage, it is on the contrary advantageous, for I am assured from experiments, that the acetate of zinc gives more activity to the acetate of silver, and produces blacks of greater intensity.

The following shows how I have come to make this remark.

Being certain that the blackening of the nitrate of silver in the light was owing to the loss of a portion of its acid under the influence of this agent I thought that the blackening would be more prompt by adding to the nitrate of silver oxydes susceptible of seizing a portion of nitric acid, lime for instance; oxyde of zinc, oxyde of lead, etc. Experience has perfectly justified this conjecture.

A piece of golden paper *rubbed* with the oxyde of zinc on a single half, and afterwards laid flatly on slightly acidulated nitrate of silver blackens as rapidly in the light upon the part covered with the oxyde of zinc as the ordinary positive paper with the chloride of silver, while the positive deprived of the oxyde scarcely discolours as is well known.

The sheet passed afterwards through the gallic acid, deepens instantly on the oxyde of zinc side, while it remains reddish on the other, if the solution of silver used is feeble; the blacks, however, are not as fine on the oxyde of zinc side.

On rubbing the oxyde of zinc impregnated with the nitrate of silver with a brush the effect is still more perceptible; for the blackening in the light, very pure shades are obtained, but it is no longer necessary to think of passing to the gallic acid, the proof would become lost in the general blackening of the sheet; but if a method were found to completely equalize the oxyde of zinc, a positive paper blackening perfectly in the light and fixing by a single wash in ordinary water freed from its chloride by a weak addition of nitrate of silver, would be thus furnished.

The oxyde of lead (or massicot) produces exactly the same effect; but it is slightly yellow, and it is susceptible of blackening under certain influences.

In a word the oxyde of zinc and the oxyde of lead act absolutely like the iodide of silver of the negatives, and they may be employed with advantage with albumen and collodion for the production of positives of extreme delicacy.

After having proved this fact I have studied the mixture of the acetate of silver with the acetates of zinc and lead. Having obtained an impression with a solution of acetate of silver, I made others from it after an addition of acetate of zinc and lead; these last required much less time in their production, and their intensity was much superior; it was certain, however, that the solution of silver was more diluted.

Thus then it is proved that certain acetates mixed with that of silver exalt its qualities. I a long time since remarked that the acetate of silver obtained from coin was better than the pure acetate of silver. All this shows that the acetate of silver, extracted from the residuums will be of great service. Photographers will not have to preoccupy themselves with the metals alloyed with the silver, as they may have reduced the nitrate by the copper, the chloride by the zinc, and dissolved the whole with the acetic acid. If the residuums contain black sediments arising from the gallic acid, it will be necessary to melt the nitrate to remove its brown color, the coal will be burnt at this moment with a great disengagement of nitrous gas.

From all these motives, lime water is very useful; a bottle should be had always containing lime at the bottom in excess; this water will serve to saturate the nitrate, if one does not wish to take the trouble to push it to crytallization; as soon as the lime water causes the appearance of a precipitate of a dark yellow color, which will be oxyde of silver, the whole is to be filtered, and a neuter solution of nitrate of silver with an addition of nitrate of lime will remain. A piece of paper steeped in this solution, exposed to the light and passed through gallic acid, will show whether it is sufficiently concentrated for use; or rather it may be considered as a saturated solution, and act accordingly.

It is easy to account for the photographic energy communicated to the salt of silver by addition of salts of the same species; the crystallization of the nitrate of silver is itself considerably cramped on account of it, its crystals are infinitely smaller, and therefore more inclined to reduction; the separation of the silver being greater in the same respect, black is produced in the place of grey, which results, it is known, in reflecting foliations of silver of considerable size. The neuter solution filtered should afterwards be slightly acidulated with acetic acid for use, whether for ordinary positive paper, or for positive papers with the nitrate of silver alone; which should be passed through the gallic acid, after an apparent browning to the portion exposed. The chloride of platina extremely diluted with water is an excellent agent for blackening proofs; it changes all the yellow and brown tones produced by the gallic acid, to absolute blacks of equal value provided the proof has been completely freed, by a wash in water free from chlorides, of all the nitrate of silver; without this the blacks would be tinted with a light yellow by a combination of the platinifereous chloride of silver, which, besides, is insensitive to the light and the gallic acid.

The residuums of the nitrate of silver may still be employed in the concentrated state, for making direct paper, fit for giving images in the camera, and for copying engravings and all other designs in black.

For this purpose the excess of acid is to be neutralized by lime water or ammonia, adding ammonia in excess, which may be perceived by its odor after mixing; the papers impregnated and half dried, take immediately a most beautiful black, on passing then to the gallic acid. The nitrate simply neutralized by lime water requires a previous exposition to the light,

until it is perceptibly browned, in order to give the same black paper.

This paper well washed and left to soak at least an hour in a solution composed of fifty parts of water to one of iodide of potassium, acidulated by a twentieth of nitric acid in black, whitens under the influence of light. It is necessary to prepare the mixture of iodide and nitric acid twenty-four hours in advance, and to leave it exposed to the air to free it from iodine; without this starched paper takes, from the fact merely of an excess of iodine, a deep blue color, which is singularly at variance with the whitening of the paper by the light.

It is known when the liquid is fit for use when it has become colorless, and particularly observing whether a piece of white paper steeped in it is any way tinted with a blue color.

This paper is very tardy in giving images in the camera; but, for the reproduction of drawing in a strong light, and especially in the sun, it colors sufficiently quick.

The image may be fixed by every agent capable of dissolving the iodide of silver which has formed in the white parts, viz., the cyanuret of potassium: the iodide of potassium, the hyposulphite of soda, chlorhydric acid, etc.

If the paper has been penetrated through and through by the ammoniacal solution, it will not be rendered blue by the iodine, and the solution of iodide may immediately be employed, which gradually loses its strength. This paper only works well when in a damp state. For the reproduction of engravings, it must be used well so as not to impair the original, a thin plate of glass should, at least be interposed between, and the whole exposed perpendicularly to the solar rays, without interruption in the duration of the isolation.

M. A. GUADIN.

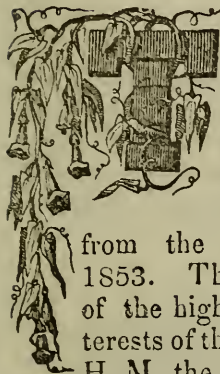
From the Journal of the Photographic Society.

LONDON PHOTOGRAPHIC SOCIETY.

FIFTH ORDINARY MEETING.*

Thursday, June 2nd, 1853.

The President, SIR CHARLES EASTLAKE, in the Chair.



THE minutes of the last meeting were read and confirmed.

The SECRETARY said that he was directed to call the attention of the Meeting to the following extract from the Minutes:—"May 12th, 1853. The Council considering it is of the highest importance to the interests of the photographic society that H. M. the Queen, and H. R. H. the Prince Albert should become Patrons of the Society, Resolved that the President be requested to take the necessary steps for carrying that object into effect." At the meeting of the Council this afternoon, the President announced that in accordance with the request expressed in the Resolution of May 12, he had made the requisite application, and that in answer he had received the following letter from Colonel Phipps:—

Buckingham Palace,
May 30th, 1853.

"MY DEAR SIR CHARLES,

"I am commanded to inform you that the Queen and Prince will willingly give their patronage to the Photographic Society. Sincerely your's,

C. B. PHIPPS."

The Chairman remarked that he merely wished to say, that having been honored with this communication from the Society, he lost no time upon his return to town, in carrying the wishes of the Society into effect.

Sir William Newton begged leave to propose the most grateful thanks of the Society to the worthy President for the

kind and zealous manner in which he undertook to carry out their wishes, since it certainly was of the highest importance to the Society that they should have such powerful patrons to aid them in their exertions.

This proposition was seconded by a Member.

The Chairman said, "It is unnecessary that I should put this to the Meeting. I beg merely to say that my thanks are due to the Society, and always will be for their honoring me with an opportunity to serve it."

The Secretary then read the names of Members who had been elected since May 5th, 1853.

The Secretary announced the presents which had been received by the Society since the last Meeting, together with the names of the donors. Among the most remarkable objects were specimens of photographic engraving from Niépce de St. Victor, of photo-lithography from M. M. Lerebours, Lemerces and Barreswil, and a large collection of positive pictures, by Dillwyn Llewellyn, Esq.

The thanks of the Society were returned to the various donors.

Specimens of Mr. Talbot's photographic steel engravings were exhibited.

Sir W. J. Newton exhibited 24 photographs from Burnham Beeches, with some of the negatives, to show the great transparency which might be obtained with paper.

The Chairman stated that it had been thought advisable that two important papers recently received, and on which it was unlikely much discussion would arise, should precede those dealing with the subject which had been announced as the principal object of consideration that evening.

The Secretary therefore read a letter from Sir J. F. W. Herschel, relating to the subject of his communication, and the following papers were then read:—

1. Sir J. F. W. Herschel, On the substitution of Bromine for Iodine in the Photographic Processes.

* Owing to the irregularity of the receipt of the Journal in the Photographic Society, we have been unable to publish these proceedings regularly but are in hopes to do so hereafter. *Ed. P. A. J.*

2. Mr. William Crookes, On the application of Photography to the Study of certain Phenomena of Polarization.

3. Mr. Leighton, On Photography as a Means or an End.—Perfection and Imperfection of Sun-pictures, &c.

Mr. Buss, On the Use of Photography to Artists.

Mr. R. Hunt, On Methods of Measuring the Variations in the Chemical action of the Solar Rays. (This paper will appear in the next No. of the Journal.)

The thanks of the Society were returned to these gentlemen, and the Meeting then adjourned until the 3rd of November.

1. SIR J. F. W. HERSCHEL, "*On the substitution of Bromine for Iodine in Photographic processes.*"

I HAVE read with considerable interest the remarks of Sir W. J. Newton, "*On Photography in its Artistic view, &c.*," communicated to the Photographic Society, and by them printed in the Journal of their Society (No. 1). These remarks are in perfect consonance with my own impressions as to the absence, in the very best photographic *landscape* I have seen, of a true artistic representation of the relative intensities of light and shade, the consequence of which is usually a most painful want of keeping;—a struggle to come forward of parts which Nature suppresses, and a want of *working out*, in features which to the eye, are palpably distinct.

Sir W. J. Newton strikes with the true eye of the painter on the more prominent evil of the whole case; he says:—"Wonderful as the powers of the camera are, we have not yet attained that degree of perfection as to represent faithfully the effect of *colors*, and consequently of *light and shade*. For instance, a bright red or yellow, which would act as a *light* in nature, is always represented as a *dark* in the camera, and the same with green. Blue, on the contrary, is always lighter. Hence the impossibility of representing the true effect of nature, or of a picture, by means of photography."

No one can have viewed the exquisite pictures of M. Regnault or Mr. Stewart without feeling that *vegetation* is unduly

black and wanting in artistic production. No one who has studied colors, not as an artist but as a photologist, can be for a moment ignorant of its cause. The red and yellow rays, and *especially the former which form so large a portion of vegetable greens*, are suppressed. They effect not the materials at present used in the photographic art in its highest development.

One word suffices for the key of the difficulty—IODINE. It is to the practically exclusive use of this element that the whole evil complained of (most justly) is attributable. I have shown (see my papers, Phils. Trans. 1840, 1842, Articles 129, 217, and "On the Action of the Rays of the Solar Spectrum on the daguerreotype plate." Lond. Ed. and Dubl. Phil. Journal, 1843, Art. xix) that iodized silver is insensible, or nearly so, to the red and orange rays—that its range of sensibility begins, with astonishing abruptness, beyond the medium yellow and within the blue region—is powerful at the indigo, and extends far into rays which have absolutely no effect in producing vision. No wonder then that iodine produces pictures unsatisfactory to the artistic eye. Iodine then must be thrown overboard or limited in its use, *coute qui coute* (and the sacrifice is a formidable one), if photography shall ever satisfy the desires of the artists.

What then are we to have recourse to? BROMINE. A new photography is to be created of which Bromine is the basis. This I have proved in my experiments on this substance (Phil. Trans. 1840, Art. 77; also Art. xix. Lond. Ed. &c. Journal, above cited). The action of every luminous ray, so far as can be traced, is equable throughout the spectrum; but the rays beyond the luminous ones act powerfully, and these must be eliminated. A glass screen with a very slight yellow tinge applied close to the focal picture, or still better, a glass cell with optically true surfaces containing a weak solution of sulphate of quinine, according to the recent results of Proff. Stokes, will effectually cut off these, and reduce the action of the rays within the limits which Art recognizes. I believe M. Becquerel has used the latter liquid with a similar view. I will only

add, that it were much to be wished that artists would study *the spectrum* and its habitudes in relation to their pigments.

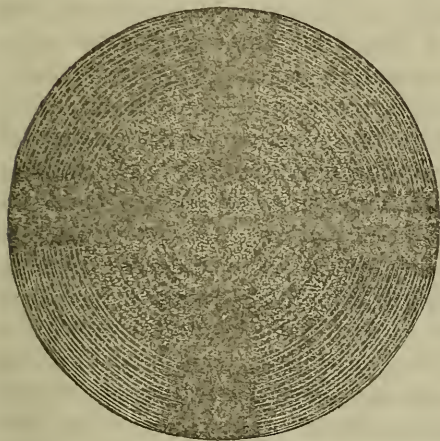
2. MR. WILLIAM CROOKES, "*On the Application of Photography to the Study of certain Phenomena of Polarization.*"

THE experiments which I have the honor to submit to the Society this evening were commenced about eighteen months ago, and had their origin in the desire to record and retain in a more tangible form the well-known beautiful figures observed when thin slices of some crystals (such as calc spar and nitre) are seen in the polariscope.

After several preliminary trials with dif-

ferent arrangements of lenses and tourmalines, in the endeavor to produce a well-defined image on the ground-glass of the camera, I finally proceeded in the following manner:—The crystal to be copied was placed between two tourmalines, and adjusted by looking through them at any diffused light; when the proper figure was obtained, the whole was cemented together with marine glue, and fastened in the brass tube of a double achromatic portrait-lens. Several lenses (non-achromatic) were placed behind the crystal to receive the image and reduce its size before falling upon the collodion plate; these vary in number and focal length, according as the image was required large or small. A lens was placed in front of all, more as a pro-

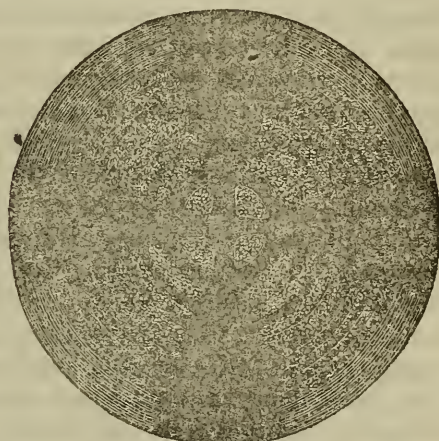
Fig. 1.



Normal.

CALC SPAR.

Fig. 2.



Abnormal.

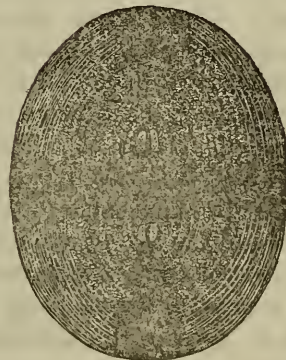
Fig. 3.



Normal.

NITRE.

Fig. 4.



Abnormal.

tection against dust, &c., than for any practical purpose; it seems, however, to condense the light a little. Although this arrangement produced a very perfectly defined figure upon the ground glass, the

light was so exceedingly faint, having to pass through so many thicknesses of glass, besides two dark brown tourmalines not a quarter of an inch square, that no image could be perceived on the focusing glass

unless the camera was held pointed direct to the sun, and every other light carefully excluded from the eye. Collodion, although so exquisitely sensitive under ordinary circumstances, was quite inadequate to copy these figures, as the plates, in their necessarily upright position, would not bear the long exposure requisite to obtain a picture without spontaneously decomposing; besides which, the camera being pointed at the sun, the motion of the latter would produce a very unequal action on the plate, fatal to the success of the experiment. After repeated trials and as many failures, I was obliged to substitute sensitive paper or the collodion plate, and leave the camera pointed for several days to the north. In this experiment, although I obtained no very good result, I had the satisfaction of knowing that light which is barely intense enough to produce a transient impression upon the retina, will, in time, produce a strong impression upon a sensitive photographic surface. I should however have obtained nothing worth preserving, had not Professor Wheatstone, to whom I mentioned the results of my experiments, kindly allowed me to use his magnificent tourmalines and crystals. On placing these in the position above mentioned, I could perceive a very visible image on the focusing glass, without the sun, and by a few preliminary trials, found that even with the diffused light of the sky, collodion would take a good impression with from an hour to two hours' exposure, varying with the size and nature of the crystal employed. The camera should be placed on the ground and pointed upwards; in this position the collodion plate will keep for more than three hours, if it be sufficiently level to retain the liquid on its surface. (I find that when kept in this manner its sensitiveness is very little impaired.) The best light is from a rather cloudy sky, bright without sun; the camera should be turned a quarter round every two or three minutes to prevent the too unequal action of the light.

The figures produced in unannealed glass under the same circumstances presented no difficulty in copying. The piece of glass, set in a black opaque frame, was placed upright in front of a black glass reflector, arranged so that the diffused light from the sky, falling upon it, might be

reflected horizontally at the proper angle and pass through the piece of unannealed glass. The photograph was taken in a camera placed opposite, having a tourmaline or Nichol's prism fastened in front of the lens; by rotating which, the proper figure was obtained on the ground glass.

My first copies were taken on collodion, iodized in the usual manner: they presented a far greater number of rings both in calc spar and nitre, and extending much further than could be seen in the polariscope: while in the latter I was not able to perceive more than eight or nine rings, upwards of fifty could sometimes be counted on the photograph, showing in a remarkable manner the greater extent of the rings formed by the more refrangible rays over those formed by the visible one.

A few weeks ago on mentioning this circumstance to Professor Wheatstone, he suggested that I might acquire some valuable information by adopting Sir John Herschel's proposition of substituting bromide for iodine of silver, and cutting off the chemical rays with sulphate of quinine; thus obtaining an effect due to the light alone. I immediately made the following experiments on this subject: Having first satisfied myself that several inches in thickness of quartz obstructed none of the chemical rays, I made a small cell of about one ounce capacity, the two sides consisting of flat plates of quartz, and the distance across the cell from one side to the other being one inch and a half: this I filled with a solution of sulphate of quinine in dilute sulphuric acid, containing 25 per cent. of the sulphate, and roughly measured the distance to which the invisible rays penetrated, by concentrating a ray of sunlight on it by means of a lens; the cone of blue light hardly reached an eighth of an inch beyond the surface. The cell filled with the solution was placed opposite the sky, and a photograph taken of it on iodide of silver with a quartz lens: the sky, on developing, came out black, while the light which had passed through the quinine had hardly affected the plate in the least. I then diluted the solution until, on trial, the cone of light reached half way across the cell; still the the photograph presented the same appearance as before, and it was not until the solution was so diluted that the cone of blue light,

formed by concentrating a ray of sunlight upon the solution, would pass completely through, that I could perceive an increase in the effect on the photograph. When the solution was no stronger than one or two grains to the ounce, there were hardly any chemical rays absorbed.

The slight effect which the light produced after passing through the strong solution of quinine, I found to be due solely to the action of the less refrangible rays. A photograph was taken of the solar spectrum, the beam of sunlight being allowed to pass through the above solution before falling upon the prism: there was a slight impression, but only where the visible rays fell. The same effect was produced on bromide of silver in a much shorter time.

I immediately procured some collodion with bromine in the place of iodine, prepared for me by Mr. Hockin; this I found to answer the purpose very well.

On copying one of the figures seen in nitre on this film, interposing a bath of a nearly saturated solution of sulphate of quinine $1\frac{1}{2}$ inch thick, I had the gratification of finding it as I had anticipated; the rings were now reduced to the visible number, and at the same time were much broader, owing to the greater extent of surface in each ring capable of affecting bromide of silver. But here a remarkable dislocation presented itself; each quadrant of the interior rings, instead of retaining its usual regular figure, appeared as if broken in half, the halves being alternately raised and depressed towards the neighboring rings.

Having obtained such unexpected results with nitre—a crystal possessing two axes—it became a matter of great interest to see whether an abnormal figure would be shown by a uniaxial crystal under similar circumstances. Calc spar was the one selected for this purpose; the figure which I had hitherto obtained on iodide of silver was a perfectly regular one, the rings gradually diminishing in breadth and distinctness as they became more distant from the centre, and differing in no respect from those seen in the polariscope but in extending to a much greater distance. When bromide of silver was employed, and the quinine bath used to intercept the chemical rays, the figure no longer presented so regular an appearance as at first; the

number of rings was now reduced to about nine, while the fourth and fifth seemed to unite together to form one large ring, entirely obliterating the intervening space.

I have since found that these effects are obtained whether the quinine bath be present or not, whenever bromide of silver is employed as the sensitive surface.

Since the rays which produce these abnormal figures do not act upon iodide of silver, but affect bromide whether a quinine bath be interposed or not, they can hardly be present in the more refrangible, invisible portion of the spectrum, or at least not in that part which is absorbed by sulphate of quinine; neither can there be invisible heat rays beyond the extreme red, since these do not affect bromide of silver. I have satisfied myself that the figures are invisible to the eye, by accurately examining each of the crystals in a polariscope, illuminated first by white light, and then by each isolated ray of a very pure solar spectrum; in no case was there any figure but the normal one perceived. It is possible, therefore, that these abnormal figures may be caused by invisible rays which have hitherto escaped notice, existing within the space enclosed by the visible spectrum.

June 2, 1853.

MR. ROBERT HUNT said,—The paper just read was certainly of the first importance to the Photographic Society, opening a series of investigations in a new path which he was quite certain would benefit the progress of photography as an art, and add considerably to the truths of science. "I only rise, however," continued Mr. Hunt, "to offer an explanation of one point in it. On a former occasion when I had the pleasure of reading a paper upon this subject, I stated, and showed by an illustration, that the chemical rays were not stopped back by the sulphate of quinine. But, as it appears from the statement made to me to-day, by the gentleman who has read the paper,—when we increase the strength of the solution, the chemical rays are considerably stopped by the action of that transparent medium. The solution which I employed, and which certainly gave me no indications of the absorption of the chemical radiations, consisted only of two or three grains of the sulphate of quinine to an ounce of water,

whereas it appears that something like 25 per cent. of sulphate of quinine in the solution was employed in the experiments made by Mr. Crookes. It is a very interesting fact to find that with a perfectly transparent solution, a perfectly colorless solution, we are able to stop back those rays which we particularly distinguish as the chemical rays. There is, however, one point upon which we certainly want, or I feel that I want, further information, before I can enlarge upon the conclusion which the author of the paper has drawn. He imagines that by using this dense solution of sulphate of quinine, he stops back the chemical rays, and that the impressions which are obtained, are obtained by the luminous rays. The whole of the results which I have obtained hitherto have certainly led me to the firm conviction that the illuminating rays of light do not act chemically upon any one of the metallic salts employed by the photographer. In case of the organic compounds, I am aware that the luminous rays producing vision and color, broadly distinguished from the dark rays that produce chemical action, do generally effect chemical changes; but I believe (of course I am open to correction), from the results which I have hitherto obtained, that we shall find that bromide of silver is not affected by the luminous rays, but is affected by a class of invisible chemical rays that pass through the sulphate of quinine associated with the light."

Mr. Robert Hunt also made some remarks upon Sir John Herschel's statement with regard to the action of bromine upon silver. "I have repeated frequently the whole of Sir John Herschel's experiments as they stand recorded in the paper to which he has so frequently referred, and in all cases I think that he does not appear to have put sufficiently forth the difference in the action between the iodide and bromide of silver. If we take a well-defined photographic spectrum, and try it upon a piece of paper covered with the iodide of silver, the action commences in the mean green ray, it goes on with a considerable amount of energy, and to a space beyond the spectrum nearly equal to the space chemically acted upon within the spectrum. We find also with regard to the spectrum that it is very liable to variations; it is very likely to become shortened. When

speaking, however, of the iodide and the bromide, Sir John Herschel does not mean absolutely iodine or bromine, unless any of his recent experiments have shown the contrary, but he takes bromide of silver produced by using the bromide of potassium and the nitrate of silver in equivalent proportions, and then allowing the slightest possible excess of nitrate of silver to produce a quickening action. Having a piece of paper so prepared, we find this very curious fact, that so far from the action commencing in the mean green ray, it takes place a considerable distance down in the yellow ray; that whereas we should have a surface which I will call a quarter of an inch, quite unacted upon on the iodide of silver, yet we should have a surface of not more than the 16th of an inch left upon the bromide of silver. There is another very curious fact, pointed out in the first instance by Sir John Herschel with regard to bromide, viz. that the red ray, the least refrangible, also produces a very considerable chemical action upon the bromide of silver. This ray is red, and in nineteen cases out of twenty (it is not *always* the case, but in nineteen cases out of twenty) the impression which the red ray makes upon the bromide is of a red color; and in some cases, as you will find in Sir John Herschel's statement, it approaches even to the brilliancy of crimson. These are a few points which lead me to believe with Sir John Herschel that it may be used. I remember upon one occasion a singular accidental circumstance; I had been taking a view of my own house at Falmouth, with a paper prepared with the bromide of silver. The objects that fell within view were the green fields, the blue sky, and the yellow stucco-fronted house.

I was called away, and left my camera still in the garden, and it was exposed for several hours to the sunshine. Much to my surprise, when I took my camera from the garden, I found that the paper had been impressed with the complementary colors of the images which had fallen upon it, thereby showing, in a very curious manner, the colorific action of the bromide of silver, so that we may by its use hope to approach to obtaining more completely the tints of nature, since it is apparent that by it we may copy greens and yellows with greater reality than by the other salts

which we have long been in the habit of employing."

SIR WILLIAM NEWTON.—I should like to ask Mr. Hunt a question, which, from his knowledge of this subject, I think he may be able to answer, and with some satisfaction to the photographic operator: Whether, in the use of bromide of silver capable of being acted upon by the red and yellow rays, it would not be necessary to alter the condition of the lenses which we at present use? I have been working lately, in consequence of hearing of the observations of Sir John Herschel, with a very considerable proportion of bromide, and have found in giving the usual exposure to light in the camera, that in many of the pictures there was an unusual redness not only in the picture itself in the representation of the lights producing dark upon the negative paper, but over the whole paper there was such a redness as is often produced in the ordinary calotype paper by over-exposure. I am unable to explain this, except that the red rays may have acted upon the bromide of silver and so produced a sort of red veil over the whole picture.

MR. HUNT.—I am only partly able to answer this question, but it does not appear to me that it would be necessary to alter the condition of the lens, provided it was properly corrected for the chemical radiations. The more completely the lens is corrected for the chemical focus, the less liable, I imagine, will it be to the interfering action of the red rays. Having a lens that was more than achromatic, such as I proposed to call a diatinic lens, there would be a certain equality of action with the whole of the rays, and we should not have this interference so decidedly as we should with an ordinary achromatic lens; certain it is, upon all the varieties of paper, that even where the differences are very slight, there is a very peculiar scale of action to which a sufficient degree of attention has not yet been paid. The examination of this has rested, I believe, up to the present moment, untouched, except by Sir John Herschel himself, and in the Philosophical Transactions to which he refers will be found a series of experiments on paper differently prepared, and on paper of a different character similarly prepared, showing a most remarkable difference in the

scale of chemical action upon those papers, arising from reasons apparently the most trivial; and it is only by attention to some of those minute points that we shall arrive at what we wish, the production of large pictures, which shall be true reflexes of natural objects in all their beauty of light and shadow.

3. MR. JOHN LEIGHTON, "*On Photography as a Means or an End -- Perfection and Imperfection of Sun Pictures. — Nature and Art contrasted; their Requirements. — The Relation of the Camera to Science and Art.*"

[Abstract.]

The object of this paper was to discuss the question which had already been argued to some extent before the Photographic Society, as to the extent to which absolute accuracy of definition is to be insisted on in photographic pictures. The author placed the argument on the footing of an inquiry into the boundaries separating art from nature, the former being defined as something founded upon and bearing resemblance to the latter. Fine art seeks to elevate the imagination by lofty images derived from nature in her most agreeable forms. Nature may be and is much conventionalized in the noblest and highest art; the abstract is given without the minutiae. In photography this is reversed; breadth being sacrificed to detail. For purposes of science, however, for example, for natural history, for the architect also, or the engineer, the utmost detail attainable in a photograph is advantageous; but the artist will not descend to minutiae; he desires breadth of effect; "*his most perfect pictures may be out of focus, his distance may fade away, and his foregrounds look indistinct, his trees appear in masses, and his figures be obscured by positive shades.*"

Photographic pictures are at present too literal to compete with works of art, containing "near and distant objects upon the same plane, backgrounds and foregrounds of equal intensity;" things known to painters to be incompatible with nature as viewed with the two eyes. The naked truth, even did the lens imprint it on the paper, would require clothing at the hands of the artist to become a work of art. Minute detail is the attribute (and an invaluable one) of the sun picture, but not so of

the work of art; consequently many photographic pictures may be cut up into several pieces, all beautiful, but no particle can be removed from a work of art without detriment, since it possesses unity. A work of art must have all the attributes of nature without her particularities, being nature in the abstract. This is illustrated by the works of Flaxman and Retsch, which as outlines have no bodily likeness in nature, but though arbitrary are so satisfactory.

Art cannot rival nature, and should not attempt to compete with her; its province is quite distinct. The marvellous detail of microscopic photographs defy human imitation, but these are not works of art. Only in the lowest walks of art is direct imitation attempted, and genius will be assisted rather than superseded by photography; he will go the process as to nature, to choose and render in unity his own; he will look upon it as the Alpha rather than the Omega of his art.

Action is almost always imperfect in sun pictures, which render figures in repose with greater effect. Action is the essence of fine art, and for its expression requires the study of nature under the influence of independent impulse, which cannot be obtained by operating on set models. Photographic portraits are often wanting in vivacity, individuality and beauty, bearing but little resemblance to the sitter. The beauty of complexion and expression is not rendered in the present state of the process; besides, it is doubtful whether the sitter can give the individuality, the character, which the artist aims to seize, and thereby to give portraits of the most ordinary pleasing and life-like effect. The same holds good in the representation of types;—the camera can only give the individual, not the type of a class, whereas the artist portrays this by selecting the best expression of each feature from a series of individuals.

“Sun-pictures may be the means of elevating taste, by rendering us more familiar with nature’s infinite beauty, and educate the eye by presenting her transient forms and effects in all their fear or favor, causing true art to be better appreciated and more widely understood; exploding its fallacies and consolidating its facts;—showing as it has, the points in which art and

science differ—that though works of art may and often do stand higher than works of circumstance in intensity, the former can scarcely hope to compete with the latter in one essential particular—true roundness; linear perspective appearing comparatively flat when contrasted with binocular perspective, as exemplified in the stereoscope.”

MR. R. W. BUSS, “*On the Use of Photography to Artists.*”

The formation of the Photographic Society will undoubtedly be of great service to artists in their studies from nature, especially if properly applied; not to render picture making a mere chemical operation, but to watch closely the effects and forms of nature herself, as she kindly sets them down with her pencil of light for the benefit of the student in art.

Photography to the artists become useful in a different point of view from that in which the art is valuable to the man of science, for it should be borne in mind, that while rapidity in the production of portraits of living animals, in fact of almost every object subject to motion, is of the first importance to all photographers, the absolutely correct definition so highly prized by the scientific man, or microscopic observer, is by no means so indispensable to the artist. It is in this aspect of the subject that Sir William Newton, in his able paper upon photography in an artistic view, has put forth ideas which are naturally startling to those photographers whose pursuit of this interesting subject is of a purely scientific character. We thus early observe in the outset of the photographic society, two distinct paths for its members to choose from—one in which the perfecting of the process of photography by subtle chemical investigation is proposed, the correcting of lenses and various improvements in the form of the camera, affording great scope for the observation of the scientific members,—while the *other* is that in which the professors and amateurs in art would recreate themselves.

The lovers of art may, if they prefer it, leave the searching investigation of the effects of the solar light upon various chemicals, or minute differences in the tinge of glass, to be pursued by those whose studies incline them to optics or chemistry

—contented with a lens, or a combination, which will give a perfect image up to the edge in a second or two of time, and a moderate amount of chemical lore so as to give a zest to his manipulations. The artist may with his camera plunge into Pre-Raffaellism, or Rembrandtism, or Reynoldsism, but of these styles our present question has to do with the latter principally.

Sir William Newton having propounded the doctrine that an object is better a little out of *focus* than well defined as in *in focus* for an artist's purpose, appears to be attacking one of the fundamental principles of optics in their application to the art of photography, and naturally wished to explain what I fear is inexplicable to any but an artist, or an advanced student in art.

Correct definition, so important where minute forms and the varieties of texture are required, is in a general sense not absolutely necessary to render photography of great use to artists, for the moment he attempts a slavish imitation of the camera picture, he is no longer an artist. But supposing the artist-photographers to have one of the best instruments which could be constructed, it is undoubtedly true, as stated by Sir William Newton, that his studies would be greatly assisted on certain occasions by throwing his objects *out of focus*, by which the forms are rendered indistinct, the minute details, or lines, as they are commonly called varnish, leaving only the large masses of light, half-tint, and shade to be judged of. The specimen sent by Sir William Newton was a good instance of this application of a non focal adjustment of the lenses. In a few seconds an arrangement of light and shade was painted, with a distribution so exact that probably an hour or more might have been insufficient to obtain so good a result. In a few minutes a different effect could be produced, and so on trying several effects of light and shade, by means of the camera, until one was found entirely suited to the group of figures about to be painted. In this employment of the art of photography, and a life spent in pursuit of art, convince, as it will artists, that correct definition would be injurious to the end proposed, which is to have *natural studies*

of breadth of effect to guide the painter in the conduct of his light and shade in his picture. This is simply employing the camera to do what is recorded as the practice of Sir Joshua Reynolds, who when he was visiting the picture galleries on the continent, blackened with a pencil the leaves of his note-book, whenever the effect of light and shade in a picture arrested his attention. It mattered not whether the picture were a landscape, portrait, historical picture, or still life; the details were of no consequence whatever; the masses of light and shade, their forms, and the proportions which the shade bore to the light, and the half-tint to both, became the object of Reynolds' study; these variously blackened pages the President of the Royal Academy afterwards consulted, when studying the effects of his numerous and beautiful works.

A nearer approach to focus, but still short of that beautiful definition so highly prized, will give artists the effects of Rembrandt, Caravaggio, Sir Joshua Reynolds, Opie, Jackson, and Thomas Lawrence's early style, also that of Sir Henry Raeburn, and many others distinguished for breadth of effect, in the English School of art.

The photographic society will accordingly be hailed with pleasure by artists; good is sure to result from the unreserved intercourse between scientific men and artist, with his ceaseless mental occupation in the composition and execution of his pictures, has no time to bestow upon a series of experiments; he must throw himself upon his scientific friends to correct lenses, and to promulgate the shortest and most certain mode of obtaining photographic pictures, while in his turn the artist can throw much light upon photography in an artist like view.

By making photography easy, it will come into general use amongst artists, and any way by which it could be made available in the painting-room, is indeed a great desideratum to them. These remarks, of course, apply principally to the painter of portrait and figure subjects.

It seldom happens that the purely scientific man has had time to bestow upon the study of art, just as it seldom happens that the artist has time to follow out a course of experiments in photography. There is therefore much to learn on both sides,

and the information thus needed will no doubt be afforded through the medium of the photographic society.

At a future time, should the subject be considered desirable, the experience of a practical artist in arranging figures and groups, in regard to composition and light and shade, will be gladly rendered to assist the non-artistic photographers.

This novel application of photography to the fine arts has not occurred to me, although in the course of my practice numerous pictures have delighted me with their broad masses of light and shade, and their truly suggestive character. These pictures, valuable in the eyes of an artist, would by the scientific photographer be pronounced entire failures.

But one glance at the specimen sent by Sir William Newton, with the few explanatory words underneath, was quite sufficient to recall to my memory the effects which had pleased me and numerous other artists, and to convince me that Sir William had by that shown a highly useful means of applying photography as an assistant to the artist's studies.

SIR W. J. NEWTON said, that the papers just read (by Messrs. Leighton and Buss) had been called forth by some observation made by him at the first monthly meeting of this society, and he was desirous of directing the attention of the members of the society to the exact terms of his communication. He wished expressly to be understood as recommending the plan of throwing portions of a picture out of focus, only for a specific purpose, especially for obtaining general effects of light and shade, in groups of figures and similar subjects, to serve as studies to aid the professional artist in his compositions. He complained that an intention had been attributed to him of advocating the general use of this plan, as producing a more artistic effect. This intention he disclaimed, so far as extended to interference with the practice of other photographers.

"It must ever be borne in mind," continued Sir W. J. Newton, "that photography is a wide field in which all persons are at full liberty to roam, and it is one of the objects of this society to induce those who have made any discovery to communicate their researches and the *mode of applying them*. It is obvious that by such free

intercourse, this delightful scientific art may be considerably improved, and made to partake more of the character of fine art; still it must not be lost sight of, that fine art and photography cannot be compared, because photography never can reach the *poetry of nature*, neither can any manual exertions attain the extraordinary and beautiful detail of photography; and indeed, every such attempt on the part of *an artist* to copy *servilely*, destroys the poetry of fine art, and thereby forfeits the character of an artist, as Mr. Buss justly remarked.

"Allusion having been made to a mode practised by Sir Joshua Reynolds while he was in Holland, allow me to state one part of his practice, in his studio, which may in some measure bear resemblance to photography.

"The late Royal Academician, Mr. Northcote (who was a pupil of Sir Joshua's) informed me many years ago, that when Sir Joshua had arranged his drapery upon the lay figure, the pupil was instructed to copy it as *correctly as possible (this may be likened to the process of the camera,)* and after having devoted hours, perhaps days, to copying every fold, the picture was allowed to dry, and when Sir Joshua took it in hand, his object was to obliterate or obscure a great part of the detail (*this again, may be compared to the lens being slightly out of focus,)* by which means he produced that breadth of character which is so remarkable in all his works.

"As this may now be considered the season for photography, allow me to direct the especial attention of photographers in general, to an endeavor to preserve the middle tints of nature, instead of that violent opposition of light and darkness, which is anything but agreeable. With respect to landscapes, one mode of effecting this object, is by exciting the iodized paper with a weak solution. I find that the strength which I have adopted will do very well for *this climate*, but for a hot climate it will be necessary to dilute once or even twice; and I am borne out in this fact by Vicomte Viger, who made use of my process in Paris last year during very hot weather, and he wrote me word that, in bringing out the negative, the paper turned brown very soon, and therefore inquired of me whether I could explain the cause. I then sug-

gested to him to dilute the chemicals one half, and if that would not do, to submit them to a further dilution. He then wrote to me, stating that my recommendation had entirely answered the object.

"Another mode of preserving the half-tints, and the gradations of the different distances, is, to use a small diaphragm; and I have been considering whether it would not be possible to give some general rule in this respect, according to the length of the focus of the lens; for instance, the lens I generally make use of is 13 inch focus, and the diaphragm half-an-inch, supposing, therefore, this to be correct, for all general purposes, a lens of 16 inch focus (or more) would require a larger diaphragm in proportion to the length of focus, because the longer the focus, the more time is required for exposure in the camera, and therefore a larger aperture would be necessary in order to make it work in the same time. This is merely as a hint for further consideration.

"I wish also to direct attention to another point, which I have never found to fail in any lens that I have made use of,—I mean as respects its range or *natural* (as I call it) focal distance, according to its focal length. I have discovered both these points in my own lens, and therefore, before I begin to take any object, I always fix the lens to a certain mark, because I know that *beyond* thirty yards, every object is in focus, or sufficiently so for all practical purposes; but for every object *within* the thirty yards, the lens must be re-adjusted according to the object required: this will however put *every other part* out of focus; but, in order to include all *beyond* this re-adjustment, you must use a *smaller* diaphragm, which will require, in such case, an exposure of double the time at least; this, however, varies according to the size of the diaphragm."

Sir. W. J. Newton, in conclusion, referred to Mr. Ross, junior, as having confirmed his statement in reference to the focal length proper to lenses.

MR. VIGNOLES.—The artist, the optician, and the engineer, each view these matters in a different light. I quite agree with the artist's wish, that we should obtain all those soft shadows which Sir Joshua Reynolds knew so well how to represent,

and which Sir William Newton wishes also to repeat. That is the end desired. We differ as to the mode of obtaining it. I should as soon think of attempting to effect the adjustment of my own eye, when I can produce a similar result by a veil, as of throwing the camera out of focus when I can obtain the effect by a variety of other means.

MR. SHADBOLT.—I cannot let this occasion pass without saying a few words upon this subject. With regard to the focusing of the lens, I may as well begin by saying that Sir William Newton and I differ *toto cælo*, as widely as light from darkness; there is no point short of infinitude at which there is any focus that will be universal; for every point that you can possibly name there is a difference, but it is true the difference is so small beyond a certain distance, that it does not signify to those who are not very particular. I think that there is a little angry feeling, if I may use so strong a term; but at any rate there is a very strong party feeling in the Society between the two classes of members, whom I may call the pre-Raphaelites and the Modern School. I confess that I am a pre-Raphaelite myself. But they should bear in mind that the objects of the two classes are totally different. An artist comes to gain information in the practice of photography, subsidiary to his art; whereas the scientific man cares very little for art; he wishes to supersede, as far as his purposes are concerned, art altogether. The scientific man does not accept art for art, but art for science; he does not like to have the representation of a national object made so perfectly beautiful that no one would recognise it. With regard to the objects being rendered too much in detail for artists, I think that there is a little throwing overboard the feeling that the artist would not like to spend such an enormous amount of time as would be necessary. He would not object to the detail, if he did not sacrifice his light and shadow; but he objects to wasting his powers of creation over a mere imitation. There was an observation, also, made by the gentleman, who read a paper previously to Sir William Newton, as to what he considered the limit of Photography. Now, in any matter connected with science, I

should be sorry to think that any limit was ever possible to be known at the present time.

SIR WILLIAM NEWTON.—I must beg your pardon, for I think you quite misunderstand what artists require. If you have read my paper carefully, you will perceive that I am confined to one position only, namely that of a sketch or study for the artist. That was the point, and the only point, in which, I believe, I differed from my photographic friends. In all other cases I have laid it down as a rule, and have said, that for architectural purposes, engineering purposes, and all purposes requiring detail, you could not have your lens too much in focus; it is impossible to have it too much in focus; but I am anxious that the Society should understand what we artists do require. We do not want at all to interfere with the photographer; we want rather to assist him, to give him artistic views as much as we possibly can, and we will take advantage of what he does for us. We are not scientific men—we have not time for it; but we want the aid of scientific gentlemen, and I hope that we shall take advantage of it largely: but I again repeat, and wish it to be distinctly understood by this Society, that we never do wish to interfere with the practice of photographers in any degree whatever; let them pursue their own course, only let us pursue ours. As I just stated, photography is a wide field; each may take from photography what he requires; he is not bound or tied down to any rule that I know of: let him take his own course, by which means not only photography will be improved, but Art will be considerably advanced. I hope it will be clearly understood that that is our object, and that I confined myself to one point only, when I said that it is better to have the lens a little out of focus.

MR. SHADBOLT.—Sir William seems to have misunderstood me. I was deprecating the feeling which has arisen, that one should limit the other.

SIR WILLIAM NEWTON.—You said you differed *in toto*.

MR. SHADBOLT.—I do, upon your conclusions; but I wish that every photographer should have pictures out of focus, if he prefers them.

DR. PERCY.—I have listened with great

attention to the papers which have been read, and the remarks which have followed them. There are several points—questions of fact—which have been alluded to in some of those papers. There is one, for example—a statement which I take the liberty to deny altogether,—namely that it is impossible to obtain the exact gradation of tint corresponding with the gradation which we find in a natural view. I not only deny that positively, but I shall be prepared on a future occasion to bring forth, I think, substantial proof of the correctness of that denial. With regard to the focus question, it appears to me that, upon a study of photographic pictures, we do find that they show how beautifully accuracy and minuteness of detail can be combined with what the artist terms breadth of effect. I think of that there is no doubt; and I believe that upon a future occasion we may see here specimens of photography which may illustrate that point. I cannot therefore concede that the proposition which Sir William Newton made on a former occasion, and has repeated several times since, that it is necessary to use a defective optical arrangement, because it comes to that, has been at all made out.

SIR W. NEWTON disclaimed the desire to apply the plan of imperfect focusing to landscapes, and appealed to Sir C. Eastlake to confirm the exception, as having witnessed the application of the method to portraiture in Sir W. J. Newton's studio.

The CHAIRMAN said, the effects shown him in the camera by Sir W. J. Newton were artistic, and artists would greatly benefit by studying them, but he thought Sir W. J. Newton would not contend that they were to supersede the more minute appearances of objects.

MR. HENRY COOKE.—My impressions as a photographer are so extremely slender, that upon any other occasion I should not occupy any portion of your time; but as a painter I will say a few words. I think that upon the successful issue of the question, which I believe is the main question of this evening, depends the whole fact of whether photography shall be a benefit or a bane, as an art. I am perfectly persuaded that if certain opinions which I am sorry to say are gaining ground, are encouraged, they will be decidedly obnoxious to art.—There is one point to which I will allude, and

which is most important. It is said that we do wrong in tampering, as it is called, with our negatives; that is, by adding skies, or any other operation which we choose to adopt. I should like to ask the most inveterate and abstract photographer what would be the effect if you were to take a fine engraving from Claude and rob it of its sky, and surround it with trees and mountains in one unbroken mass? Would it not be totally ruined? Then I again appeal to any artist, whether it is not necessary, before we can form the least idea of the effect of our pictures, that every part should be covered; and if there is not the most extraordinary effect constantly produced upon parts finished by the completion of other portions? I think that this is really a very essential point, that we should be allowed to do what may be necessary to complete the effect, and I think also that photographers themselves are bound to allow us to do this, because the very beauties of a photographic work will be developed by the fact that the thing is complete.

With regard to the question of focus, I am not prepared to enter into that. It appears to me to be a scientific, rather than an artistic question. The only objection which appears to me is, that if you throw one part out you must get another in; and that the one which you get in may not be the principal object; and therefore, it seems to me, that it is limited to the studies necessary for the painter; and that I believe to be Sir William's notion. With

a view to the completion of photography it struck me as a most essential thing—I believe the grand question before us is the bearing of photography upon art—to arrive at some mode by which we can take the sky simultaneously with the landscape. With that view, I have endeavored to construct a little instrument by which it can be done so instantaneously, that I think I can take the sky, which I believe belongs to a landscape, at once.

[Mr. Cooke here produced the Model to which he had referred, and explained it to the Meeting.]

The CHAIRMAN.—Have you a specimen?

MR. HENRY COOKE.—I am sorry to say, I have not; but I will bring one to the next meeting.

DR. PERCY.—I believe that the sky has been taken long ago, and that there are some very beautiful specimens of skies.

MR. HUNT reprobated the practice of touching negatives in order to produce skies, or particular desired effects. He considered it a question of honesty.—Touched photographs, unaccompanied by a statement of the fact of their having been “doctored,” were deceptions. He mentioned that some of the photographs in the Exhibition now open in London had been altered by painting over the distance.

SIR W. J. NEWTON concurred fully with Mr. Hunt as to the absolute obligation to mark upon a photograph the fact of its having been touched.

FLUORIDE OF AMMONIA.—To obtain this salt pure, mix together 2 pint of muriate of ammonia and 2 parts fluoride of sodium; put the mixture in a silver crucible, the cover of which is arranged in such a manner as to contain cold water, which is to be renewed occasionally. Then heat it, and the two salts are decomposed. Fluoride of ammonia sublimes in prismatic crystals underneath the cold cover, and chloride of sodium remains in the crucible.

Fluoride of ammonia combined with iodide of potassium gives great sensibility to photographic papers; this is due to the reducible action of the hydrogen, which enters largely into its composition, and to that of fluorine. Yet, although it gives greater sensibility the fluoride of potassium is preferable as it has more stability. It is also necessary, in order to obtain constancy in the result to operate while in a nascent state.

From the Journal of the Photographic Society.

ON THE PREPARATION OF ALBUMENIZED PLATES.

BY M. LABORDE.

(From La Lumiere, March 9, 1853.)



As you have directed the attention of your readers to negatives obtained on albumen, I venture to point out to you a very expeditious way of preparing this substance.

Add four or five drops of common acetic acid (distilled vinegar) to the white of each egg, and after having gently agitated with a glass tube to mix well together, leave the whole at rest. In a short time the albumen will become liquified, and throw up to its surface a coagulated matter, which may be readily separated by straining through fine linen.

By dissolving $\frac{1}{2}$ a drachm of iodide of potassium in 3 oz. of albumen prepared in this manner, and adding just enough sugar to prevent it cracking under the influence of a gentle heat, we obtain a layer which exhibits very satisfactory characters in the subsequent operations. If the other conditions of success are present, one minute's exposure in the camera is sufficient to produce the impression of a building or a landscape. I have satisfied myself from many observations that the sensibility depends in great part on the degree of coagulation of the albumen; it is but an inert excipient, destined to fix the active substances. If it imprisons them too strongly, the play of affinities cannot act so freely; their mutual action under the influence of light is slackened, and the sensibility is diminished. The same may be said of collodion, the firmness and degree of coagulation of which depend on so many different conditions; hence the general recommendation to apply the silver salt to it before its complete dessication. Other circumstances being the same, then the sensibility depends rather upon the *state* than the *nature* of the layer intended to fix the active substances; witness the in-

stantaneous impressions obtained on albumen by Mr. Talbot. These impressions probably exist only in the extreme surface; indeed many operators have remarked that when a layer of iodized albumen is placed on a diluted bath of silver, slightly acidulated, the abundance of water partly dissolves the albumen, the weak nitrate of silver partly coagulates it, and an iodide of silver is formed, weakly imprisoned, which is extremely sensitive; but simple washing, and often even the solution of gallic acid, remove it as easily detached powder. By following out this idea, perhaps layers of albumen may be hereafter rendered as sensitive as collodion.

I always find much advantage in combining acetate of lime with the gallic acid; but these substances must not be placed both at once in pure water, for they rapidly blacken. It is requisite, as I have elsewhere advised, to allow a piece of camphor to remain for some hours in the water which holds the gallic acid in solution, to add a little acetic acid, and then put in the acetate of lime. Very often the layer of albumen exhibits a tarnished and dead surface after all these operations; the employment of camphor in the gallic acid, and even in the silver bath, ordinarily preserves all the brilliancy, and it requires close inspection to tell which side of the glass has received the image. A little nitrate of potash added to the gallic acid contributes to the clearness of the lights. This substance produces an excellent effect in the sulphate of iron used for developing impressions on collodion. It must be added *after* the sulphuric acid, otherwise the acid, heavier than the solution, descends to the nitrate and liberates strong nitric acid, which, when it comes in contact with sulphate of iron, produces a change well known to chemists; the solution is blackened and then contains nitrous acid, injurious to the development of the image.

Tartaric acid added in small quantities

to the sulphate of iron, gives intensity to the blacks; its efficacy is more evident when it is used to develop a negative on paper. If it gives a yellow color to the

sulphate, sulphuric acid must be added until the liquid returns to its original tint.

LABORDE,

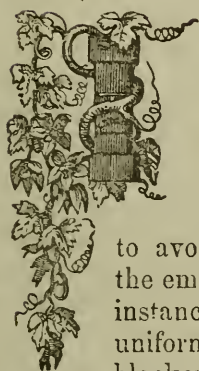
Prof. of Physics, at Piguelin, near Nevers.

From the Jour. of the Phot. Soc.

NEGATIVES ON GLASS.

BY M. A. GAUDIN.

(From La Lumiere, March 5, 1853.)



HAVE for some months been occupied in obtaining negatives on glass, of views; the negatives taken on albumen during last summer all presented the same defects, which it is possible

to avoid or conceal, especially in the employment of collodion. For instance, the skies were always uniform and the borders much blacker than the centre.

The skies are necessarily rendered uniform from the impossibility of fixing the ever-moving clouds; but skies might be obtained with a lowered tint, which would improve these pictures as much as the shaded back-ground of portraits; this is the only means of producing the sensation of space or depth, and it is surprising that photographers have made no attempts to give their pictures so essential an effect.

M. Bayard alone has published a process for giving clouds in the skies; the idea is excellent, but there will always be an extreme difficulty in harmonizing these clouds with a view to which they do not belong; in my opinion it would be better to operate so as to obtain lowered skies when albumen is employed, and clouds themselves when collodion is used.

An inspection of the admirable sea-views of MM. Macaire, in which the clouds are given with the utmost perfection, will at once give an idea of what collodion promises in this way; their superb daguerrean pictures have all the charm of a painting by a great master, since the aerial perspec-

tive is complete; if the sky were uniform like that which ordinarily accompanies our present views, these pictures would lose all their charm; the movement of the waves would always be traced with interest, but we should no longer have the sensation of depth and immensity which seizes us in contemplating their magical views.

The sky is at all times five or six times more illuminated than terrestrial objects on the first plane; if we cannot hope to fix the clouds with albumen, it will always be easy to obtain the effect of the vault of heaven, by gradually lowering a screen which will successively cover the sky, commencing above, and then the distance; by this means a considerably lowered tone will be obtained, which, moreover, will prevent the appearance of the streaks which often spoil fine pictures and oblige us to throw them aside.

The time of this lowering, as I have already said many times, should be about five or six times less than that of the total exposure; with collodion, which will only take a minute instead of a quarter of an hour for the total exposure, it will not last more than 10 seconds at most, and consequently the distant clouds will often be marked; and if means were found to take the sky with the full opening of the diaphragm, while the screen masked the view, then to take the view with a small diaphragm while the sky was screened, we should have a complete picture with a sky taken instantaneously. From their mobility, the clouds are always rendered better with a large opening than with a small one; and besides, as the attention must be given to the

terrestrial objects, it is important that they should be given without hardness.

To obviate the excess of light which falls in the middle of the plate, with any object-glass whatsoever, it would be useful also to hold before the lens for a certain time a disc of velvet, kept in continual movement backwards and forwards, to prevent its giving an impression: this would only be applicable to albumen, for the excess of light can be estimated at most at a tenth of the total exposure; if care be taken to screen the sky, it is very probable that this last precaution will be useless, for it is pretty nearly certain that this excess of light arises from the diffusion of the brilliancy of the sky by the lens.

Uniform skies present a certain difficulty when we desire to print proofs; the intensity of the black is not always in relation with that of the light which has produced it; this black has a limit which it does not exceed, and which is never impenetrable by light, especially since its tint is often bluish, and consequently permits the photogenic rays to pass; it is for this reason that the skies are commonly screened with a very thick layer of Indian ink or a sheet of paper.

Having experienced some difficulty in the employment of Indian ink for this purpose (the ink being often of bad quality), I have sought other means of accomplishing the same object. I have succeeded better by laying over the sky a very thin coat of picture-varnish, upon which, at the period when the varnish was almost dry and scarcely stuck to the finger, I applied, by means of a little ball of cotton wool, powder of silver, black-lead, or any bronzing powder. Silver leaf did not succeed so well.

The powder of silver for this purpose is prepared by pouring a solution of nitrate of silver into a dilute solution of protosulphate

of iron; if the precipitation does not take place immediately, it will sooner or latter, and the particles of silver will only be a little more lamellar.

But I have had best success in the employment of a yellow varnish, composed of *gum-water saturated with yellow chromate of potash*. All varnishes of a yellow or intense red color have the property of intercepting the photogenic rays; they have, moreover, the advantage of enabling us to lower the parts which are too strong by covering them with a coat of this varnish, which in this case must be excessively thin and well glazed. A layer of the chromate-varnish, thick enough to appear of a pure yellow, like the crystals of the salt itself, when held up to the light, produces a perfect white on the positive paper.

A very thin layer of varnish with silver powder, has the advantage of producing opacity with a very slight thickness; it is preferable to thick layers of Indian ink, which interfere with the application of the paper upon the negative in their neighborhood, and render the impressions confused; it was an imperfection of this kind which drew my attention to this rough mode of operation. I was much astonished at the thickness of this application, and the warm water which I was obliged to employ to remove it caused the albumen to split in the vicinity of the sky, producing an appearance of starry black points which it was impossible to remove.

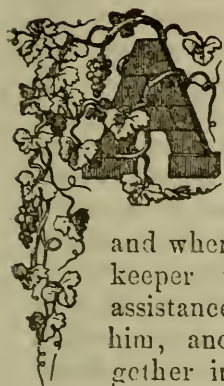
I have also tried to blacken the skies and to color the parts which were too strong by successive applications of nitrate of silver and the developing liquids, after exposure to the light; I have already obtained some results, but not decided enough for me to describe the process at present. This method appears to me preferable to all others, from the solidity of the effects and the total absence of thickness.

FLUORIDE OF BROMINE.—A union of two parts fluorine and one of bromine. It is formed in the preparation of the

solution for the fluorotype, and in that of the fluo-bromide of lime for the daguerreotype.

LIFE OF HENRY FUSELI.*

BY A. CUNNINGHAM.



little of his wit and satire he reserved for his elder brethren of the easel and the modeling stool. He had aided Northcote and Opie in obtaining admission into the Academy, and when he proposed himself for keeper naturally expected their assistance—they voted against him, and next morning went together into his house to offer an ex-nation. He saw them coming—he opened the door as they were scraping their shoes, and said, “Come in—come in—for the love of heaven come in, else you will ruin me entirely.”—“How so?” cried Opie. “Marry, thus,” replied the other; “my neighbors over the way will see you, and say, ‘Fuseli’s *done*—for there’s a bum-bailiff,’ he looked at Opie, ‘going to seize his person; and a little Jew broker,’ he looked at Northcote, ‘going to take his furniture,’—so come in, I tell you—come in!” On Northcote especially he loved to exercise some of the malevolence of rival wit. He looked on his friend’s painting of the Angel meeting Baalam and his ass. “How do you like it?” said the painter. “Vastly, Northcote,” said Fuseli, “you are an angel at an ass—but an ass at an angel.” A person who desired to speak to the keeper of the Academy followed so close on the porter, whose business it was to introduce him, that he announced himself with an expression which the inimitable Liston has since rendered proverbial. “I hope I don’t intrude.”—“You do intrude,” said Fuseli, in a surly tone. “Do I?” said the visitor; “then, sir, I will come to-morrow, if you please.”—No, sir,” replied he, “do not come to-morrow, for then you will intrude a second time: tell me your business now.”

Fuseli spared no one: on Nollekens he was often very merciless; he disliked him for his close and parsimonious nature, and

rarely failed to hit him under the fifth rib. Once at the table of Mr. Coutts the banker, Mrs. Coutts, dressed like Morgiana, came dancing in, presenting her dagger at every breast: as she confronted the sculptors Fuseli called out, “Strike—strike—there’, no fear; Nolly was never known to bleed.” When Blake, a man infinitely more wild in conception than Fuseli himself, showed him one of his strange productions, he said, “Now some one has told you this is very fine.”—“Yes,” said Blake; “the Virgin Mary appeared to me, and told me it was very fine: what can you say to that?”—“Say?” exclaimed Fuseli, “why, nothing—only her ladyship has not an immaculate taste.”

From 1817 to 1825, Fuseli exhibited at the Academy a dozen of pictures, and neither the fervor of his fancy nor his skill of hand had failed him in the least. Of his last twelve pictures, six were received with much approbation—Perseus starting from the cave of the Gorgons—the Lady and the Infernal Knight in Theodore and Honorio—Dante, descending into Hell, discovers in a whirlwind the forms of Paolo and Francesca—an Incantation from Theocritus—Theseus, Ariadne, and the Minotaur—and Comus from Milton. These works attest his love of poetic art, and his resolution to die as he had lived—in the service of his loftier Muses.

With wit of this order, and willingness to let it be felt, he had nevertheless many friends, and among them we must number the students of the Royal Academy. Those of the year 1807 presented him with a silver vase, designed by one whom he loved—Flaxman the sculptor: he received it very graciously. Ten years afterward he was presented with the diploma of the first class in the Roman Academy of St. Luke.

He had the art of acquiring friends and the rarer art of retaining them. To the names of Cadell, and Boydel, and Armstrong, his first and intimate companions, he added many more as he increased in years; and in naming those who purchased his works, we name the chief patrons of

* Continued from page 126, vol. 6, No. 2.

the poetic style of painting. Roscoe, the elegant author of the life of Leo the Tenth, bought eleven—Wood Mason purchased four—Sir Robert Smythe became proprietor of several—six went to the gallery of Mr. Locke of Newbury Park—two were purchased by Sir Brooke Boothby—as many by the late Lord de Tabley—Graham Moore and Carrick Moore, brothers of Sir John Moore, commissioned several. Mr. Knowles increased his collection to a dozen, and the Earl of Guildford, a kind and constant friend, became proprietor of forty. He exhibited in all some seventy pictures—but he painted upwards of two hundred, and those are scattered through many collections. One of great merit—Paolo and Francesca—is honorably placed in the gallery of Sir Thomas Lawrence; and another singularly wild and beautiful piece is in the keeping of one who feels its worth, Mr. Wainewright.

His life, though not without disappointment, had been hitherto without sickness, and his spirits seemed inexhaustible, but old age had now come upon him and the end was drawing nigh. He had lived eighty years and upwards, enjoyed the world, and obtained no little distinction: nor was he insensible to the advantages which he had enjoyed. “I have been a happy man,” he said, “for I have been always well, and always employed in doing what I liked;” a boast which few men of genius can make. When work with the pencil failed, he lifted the pen, and as he was ready and clever with both, he was never obliged to fill up unemployed time with jobs which he disliked.

He was on a visit to the Countess of Guildford at Putney Hill, and having engaged to dine with Mr. Rogers the poet, along with Sir Thomas Lawrence and Mr. Otteley, was about to proceed to London, when he felt suddenly indisposed. Lady Guildford persuaded him to send an apology, which he wrote with reluctance—he went to bed, and grew worse and worse. Doctors Holland and Crichton, two skillful physicians, were called in—but nature, which had lasted long, was manifestly giving way, and all aid proved unavailing. Fuseli was perfectly calm and quite conscious of his situation. “My friend,” he said to Mr. Knowles, who hurried from London to see him, “I am going to that bourne whence

no traveler returns.” He spoke with the same cheerful resignation and calmness to Lady Guildford and her accomplished daughters, who watched over him with much solicitude, and seemed uneasy and restless when Sir Thomas Lawrence, who admired and loved him, was away from his side. Early in the morning of the fifth day of his illness a fatal change in his looks was visible—he seemed aware of this—he looked anxiously round the room—said several times, in a low and agitated voice, “Is Lawrence come—is Lawrence come?” and then appeared to listen for the sound of the chariot wheels which brought his friend once a day from London to his bedside. He raised himself up a little—then sank down and died, on the 16th of April, 1825, in the 84th of his age.

For the character of Henry Fuseli, personal and mental, I willingly transcribe the words of Lavator; they are less the offspring of his wild speculations in physiognomy than the settled convictions of his heart and mind; it is to be remembered that our artist and he were early and attached companions. “The curve which describes the profile in whole is obviously one of the most remarkable: it indicates an energetic character which spurns at the idea of trammels. The forehead, by its contour and position, is more suited to the poet than the thinker. I perceive in it more force than gentleness—the fire of imagination rather than the coolness of reason. The nose seems to be the seat of an intrepid genius. The mouth promises a spirit of application and precision, and yet it costs the original the greatest effort to give the finishing touch to the smallest piece. Any one may see, without my telling it, that this character is not destitute of ambition, and that the sense of his own merit escapes him not. It may also be suspected that he is subject to impetuous emotions, but will any one say that he loves with tenderness—with warmth to excess? Though capable of the greatest actions, to him the slightest complaisance is an effort. His imagination is ever aiming at the sublime and delighting itself with prodigies. Nature intended him for a great poet, a great painter, and a great orator—but, to borrow his own words, ‘inexorable fate does not always proportion the will to our powers; it sometimes assigns a copious

proportion of will to minds whose faculties are very contracted, and frequently associates with the greatest faculties a will feeble and impotent.' "

This, we must confess, is a shining but not a very amiable character—a less theatrical description may not be unacceptable. Fuseli was of low stature—his frame slim, his forehead high, and his eyes piercing and brilliant. His look was proud, wrapped up and sarcastic—his movements were quick, and by an eager activity of manner he seemed desirous of occupying as much space as belonged to men of greater stature. His voice was loud and commanding—nor had he learned much of the art of winning his way by gentleness and persuasion—he was more anxious to say pointed and stinging things than solicitous about their accuracy; and he had much pleasure in mortifying his brethren of the easel with his wit and overwhelming them with his knowledge. He was too often morose and unamiable—habitually despising those who were not his friends, and not unapt to dislike even his best friends, if they retorted his wit, or defended themselves successfully against his satire. In dispute he was eager, fierce, unsparing, and frequently precipitated himself into angry discussions with the Council, which, however, always ended in peace and good-humor—for he was as placable as passionate. On one occasion he flew into his own room in a storm of passion, and having cooled and come to himself, was desirous to return; the door was locked and the key gone; his fury overflowed all bounds. "Sam!" he shouted to the porter, "Sam Stowager, they have locked me in like a blasted wild beast—bring crowbars and break open the door." The porter—a sagacious old man, who knew the trim of the Keeper—whispered through the key-hole, "Feel in your pocket, sir, for the key!" He did so, and unlocking the door, with a loud laugh exclaimed, "What a fool—never mind—I'll go to the Council, and soon show them they are greater asses than myself."

Men interpreted Fuseli's frequent complaints of want of encouragement in his art as tantamount to an acknowledgment of poverty. He became a member of the Academy at the urgent request of his wife, in order that she might be sure of forty

pounds annually in case of his death; and the Royal Academy bestowed the keepership upon him in order to avoid the reproach of permitting a man of his learning and genius to suffer from want in his old age. To the surprise of his executors and the astonishment of his brethren, he died comparatively rich. How he had contrived to hoard, no one could divine; the sums which he received for his paintings were not large; the earnings of his pen could be but moderate, and in his native land he inherited no patrimony. He lived at little expense, it is true—but frugality cannot make much out of a small income. I hesitate to mention, what I suspect is the truth, that opulent friends opened their purses to him, in the belief that such kindness was not unseasonable, and that Fuseli wanted the candor or the fortitude to confess that he had no real occasion for such benevolences.

As a painter, his merits are of no common order. He was no timid and creeping adventurer in the region of art, but a man peculiarly bold and daring—who rejoiced only in the vast, the wild, and the wonderful, and loved to measure himself with any subject, whether in the heaven above, the earth beneath, or the waters under the earth. The domestic and humble realities of life he considered unworthy of his pencil, and employed it only on those high or terrible themes where imagination may put forth all her strength and fancy scatter all her colors. He associated only with the demigods of verse, and roamed through Homer, and Dante, and Shakspeare, and Milton, in search of subjects worthy of his hand; he loved to grapple with whatever he thought too weighty for others; and assembling round him the dim shapes which imagination called readily forth, sat brooding over the chaos, and tried to bring the whole into order and beauty. He endeavored anxiously to

"Produce those permanent and perfect forms,
Those characters of heroes and of gods,
Which from the crude materials of the world
His own high mind created."

But poetry had invested them with a diviner pomp than Fuseli could command, and it was on these occasions that he complained of his inability to work up to the conceptions of his fancy. He had splendid dreams, but like those of Eve they were

sometimes disturbed by a demon, and passed away forever before he could embody them.

His main wish was to startle and astonish—it was his ambition to be called Fuseli the daring and the imaginative, the illustrator of Milton and Shakspeare, the rival of Michael Angelo. Out of the seventy exhibited paintings on which he reposed his hope of fame, not one can be called commonplace—they are all poetical in their nature, and as poetically treated. Some twenty of these alarm, startle, and displease; twenty more may come within the limits of common comprehension; the third twenty are such as few men could produce, and deserve a place in the noblest collections; while the remaining ten are equal in conception to any thing that genius has hitherto produced, and second only in their execution to the true and recognised masterpieces of art. It cannot be denied, however, that a certain air of extravagance and a desire to stretch and strain is visible in most of his works. A common mind, having no sympathy with his soaring, perceives his defects at once, and ranks him with the wild and unsound—a poetic mind will not allow the want of serenity and composure to extinguish the splendor of the conception; but while it notes the blemish, will feel the grandeur of the work. The approbation of high minds fixes the degree of fame to which genius of all degrees is entitled, and the name of Fuseli is safe.

His coloring, is like his design, original; it has a kind of supernatural hue which harmonizes with many of his subjects—the spirits of the other state and the hags of hell are steeped in a kind of kindred color which becomes their characters. His notion of color suited the wildest of his subjects; and the hue of Satan and the lustre of Hamlet's Ghost are part of the imagination of those supernatural shapes. Yet original as his coloring is, and suitable to the scenes which it often embodies, it seems unnatural when applied to earthly flesh and blood, and communicates hues which belong to other worlds to the sons and daughters of Adam. It is to be praised rather than imitated, and would be out of harmony with subjects of common emotion and every-day life.

His sketches are very numerous, amounting to eight hundred, and show the varied knowledge and vigorous imagination of the man. He busied himself during his hours of leisure with making sketches and drawings from scenes which had occurred in his reading, or had arisen on his fancy; in this manner he illustrated the whole range of poetry ancient and modern. Those who are only acquainted with Fuseli through his paintings know little of the extent of his genius; they should see him in his designs and drawings, to feel his powers and know him rightly. The variety of those productions is truly wonderful, and their poetic feeling and historic grandeur more wonderful still. It is surprising, too, how little of that extravagance of posture and action which offends in his large paintings is present here; they are, for the most part, uncommonly simple and serene performances.

Scattered among those sketches, we are sometimes startled by the appearance of a lady floating gracefully alone in fashionable attire—her patches, paint, and jewels on—and armed for doing mischief among the sons of modern men. There is no attempt at caricature—they are fac-similes, and favorable ones, of existing life and fashion. Their presence among the works we have described jars upon our feelings—they are out of keeping with the poetic simplicity of their companions, and look as strange as court ladies would do taking the air with the Apollo and the dying Gladiator. They do, however, what the painter meant. They tell us how contemptible every thing is save natural elegance and simple grandeur, and that much which gives splendor to a ball or levee will never mingle with what is lofty or lasting.

His love of the loose wit and free humor of the old writers of Italy and England was great; as he read them he chuckled with pleasure, and taking up his pencil lent form to such scenes as gladdened his fancy. Those works are entitled to the praise of poetic freedom and vivacity—the humor and the wit triumph over levities—and sense has generally the better of sensuality. Fire, however, fell among most of these when he died—nor do I blame the hand of his widow who kindled it.

We cannot contemplate the portfolios of

his serious drawings, opened to us by their possessor, Sir Thomas Lawrence,* without being struck with the extraordinary genius of Fuseli, and lamenting the blindness and deficiency of taste of the age in which he lived. Had he received any thing like adequate encouragement, public feeling would have awed down his extravagance of imagination, and those compositions, now consigned to the cabinet of his eminent friend, would have been expanded into pictures and adorning the galleries of our country. Of all the painters whom this country has encouraged—they are not, indeed, many—no one had either the reach of thought or the poetic feeling of Fuseli—he had comprehension for all that is great, and imagination for all that is lofty.

Of all his literary compositions something more should be said—I rank them high, and yet considerably below the efforts of

* This kind and generous man has lately been lost to us (January 7th, 1830.) His life, if the author be spared to complete another volume of this work, will be included.

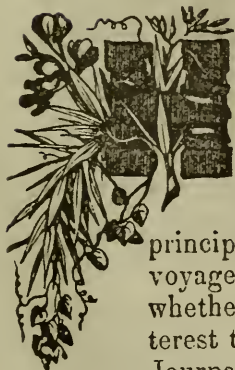
his pencil. He affected to strike out remarkable sentences and express characters by a few weighty words—to utter instructions pointed and oracular; to season sound counsel with shrewd wit, and by the use of poetic diction give warmth and energy to the whole. To accomplish this, generally, required a better disciplined mind, and perhaps a better acquaintance with our language than he possessed; but in many passages his success is splendid. He always feels well, often deeply; but the great fault is, that he seldom allows the stream of his mind to run smoothly along; he leads it astray into artificial falls, and bewilders it in links and serpentine. He had such a high opinion of his own acuteness and wisdom, that he wrote a whole volume of Aphorisms on Art, three hundred in number; some of these are said to be acute, some sensible, some profound, and a great many visionary. He also began a regular history of his art, but stopped at Michael Angelo. The fragment has not as yet been published.

From the Journal of the Photographic Society.

NOTES FOR TRAVELING PHOTOGRAPHERS.

BY M. OPPENHEIM.

(From *La Lumiere*, April 9, 1851.)



HAVING returned some months since from a journey in Spain, whence I brought back photographs, and having now before me positive prints, I communicate a few hints referring principally to photography "en voyage," leaving you to judge whether they possess sufficient interest to be worth printing in your Journal.

1. Those who travel in Spain or in other climates more southern than our own during the warm season, should avoid as much as possible wooden boxes. The driest wood taken from our country suffers much,

on account of the great heat and the variability of the temperature, as also from the imperfect means of locomotion. There will be especial cause to regret placing glass or porcelain vessels in boxes which they fit too tightly.

Perhaps much of this inconvenience might be avoided by using leather instead of wood, or even American woods.

2. For taking photographs in Spain, it will be well to provide a lens of very short focus, because most of the monuments are surrounded by houses, which prevent the choice of a very distant point of view. At the same time, the complaisance of the inhabitants, when one asks permission to enter their houses with one's instruments, cannot but be praised.

3. It will also be well to learn the rules of the customs' officers, and to conform to them as much as possible. I allow readily that a better plan might be found; but I found it requisite, in each town where I wished to say, to take all my photographic objects and show them at the custom house, both on my arriving and departing.

4. Travellers must not expect to find good distilled water everywhere; I met with it only in Madrid and Granada. At Seville, for example, I applied to the best pharmaceutical establishment, but could not use the water they sent me; so that a little still is almost indispensable.

5. It is still less to be expected to find chemical products fit for us.

It is essential not to neglect testing those we take, before setting out, and not to trust entirely to the druggists.

When I for the first time made a solution of nitrate of silver, I perceived that it became thick in the distilled water, and gave a milky appearance as in common water. I was inclined to attribute the cause rather to the water than the nitrate, although the water was obtained from the same shop as the nitrate; nevertheless I obtained the same result with water I distilled myself with the greatest care.

Although the solution became clear after having been filtered, it gave bad results, particularly with waxed paper, and in M. Le Gray's process, which I wished to employ principally, and which I had had an opportunity of learning from himself. In plunging the waxed paper into the solution of aceto-nitrate of silver, I used a brush, as I had seen him do. Subsequently, after use, I perceived black undulating lines upon the glass. At Seville, when I showed the process upon wax paper to a photographer of that city, he soon succeeded. But subsequently he complained to me of these black lines when he had used my solution of aceto-nitrate of silver.

I could no longer attribute the cause to the distilled water, and I could not but suspect the nitrate of silver. It was only towards the close of my journey that I arrived at certainty.

As I remarked that these black lines occurred on the side of the paper which had been touched by the brush, I tried to lay the paper in the aceto-nitrate: at first

upon one side, perhaps for a minute, until it was well spread out, then turning it rapidly on the other side, and then, by shaking the basin, the paper was immersed in the solution without having been arrested during the dipping in, and I then only used the brush to remove the little bubbles of air. After this I never saw any more black lines.

I only thought of this at a late period, and after having remarked these lines, although they were often so slight that they did not appear when the picture was held up to the light; on the other hand, being a long time without proper baths, for my two glass vessels were broken, and having been compelled to construct baths which I could only use a few times, I decided upon abandoning the waxed paper and iodizing other paper. Permit me to relate the mode briefly.

It is a process, however, which cannot be regarded as new, as it is based upon several well known methods.

The speciality consists merely in a very few things, which it has probably been forgotten to mention in the published accounts, but which are necessary to render these methods applicable on excursions and in warm weather.

The processes I have combined are those of albumen and the sugar of milk, adding a washing in distilled water after the preparation with the aceto-nitrate of silver.

In 9 oz of distilled water saturated with sugar of milk, I dissolved $2\frac{1}{2}$ drms. of iodide of potassium, to this I added the clear part of the whites of five eggs (beaten up as usual), iodized by $2\frac{1}{2}$ drms. of iodide of potassium; I laid the paper, only on one side, in the bath for nearly five minutes, which I think the most suitable time. By not taking more eggs, the paper spreads very easily upon this liquid, without forming bubbles of air, as in simple water. It is probable that more white of egg might be added, to render the photogenic layer still more uniform, without giving rise to that inconvenience.

Before placing the paper thus iodized on the aceto-nitrate, I held it before a strong fire. I composed the bath of aceto-nitrate of silver 1 : 2 : 10 and, not that I intend to fix in any definite way the duration of this bath, I ordinarily left the paper seven to twelve minutes (according to the temper-

ature and the thickness of the paper), after which I placed it upon the distilled water, for the time during which a second sheet remained on the aceto-nitrate. After this washing I tried it with blotting-paper.

I always wetted the paper solely on the iodized side, which allowed of my using large pieces of glass instead of dishes, of which I had been for a long time deprived.

I had tried the sugar and albumen papers some time after these preparations were published. Although I obtained very good results, I could not preserve these papers more than a few hours, in summer, after the bath of nitrate. Now, when I have washed the paper, I preserve it perfectly for twenty four hours, in the greatest heat of the south of Spain (I was there from July to November). I have not tried whether it can be preserved longer, because I did not require more time, but it seems to me very probable that if this last washing with water prolonged sufficiently, the paper might be preserved much longer, and perhaps as long as the waxed paper; for I think it a mistake to attribute this property of waxed paper to the waxing or the iodizing, rather than to the last washing with distilled water. Such washing, and a smaller proportion of nitrate of silver, will doubtless render most photogenic layers fit for keeping; and in the same way, collodionized glasses, which preserve little of their sensibility, might perhaps be used a long time after their preparation, for excursions, on the next day for example, if they were washed with water. This might easily be tried.

I have dwelt a little upon this point because a preference has been claimed for waxed paper, in attributing to it the especial property of preserving better under great heat than other photogenic papers. Permit me to add a few comparative observations.

The paper which I had prepared in the manner described, was preferable to the waxed paper, in my eyes, but I do not say it will be so in general. I have obtained very delicate impressions with waxed paper, but the results were not constant, I fancied I detected (not to speak of the temperature, which in most parts of Spain changes very rapidly) that everything depends upon the proper time during which the waxed paper should remain upon the bath of aceto-ni-

trate of silver. When the action of this bath is too much prolonged the sensibility is considerably weakened, and when the exposure in the camera is prolonged the impressions obtained are monotonous. If the action of the bath is too short, the impression will be harsh, without sufficient delicacy, which also frequently arises from too great a prolongation of the bath of gallic acid.

These, as will be seen, are the same difficulties as those accompanying older processes.

On the other hand, with paper prepared with sugar of milk, as I have said, there is nothing to fear from prolonging the bath of aceto-nitrate too much; the limit of time for this bath is not so restricted as with waxed paper, nor is that for the gallic acid bath after the exposure. For this latter I have taken gallic acid, not in any fixed quantity, and dissolved it in the water used for washing, which is slightly nitrated. With waxed paper it is more difficult to know when to stop, and there is a risk of obtaining, by too strong an action of the gallic acid, a spotted negative, for it is not perceived while the picture is in the bath; and when it is fixed and the wax remelted, if spottiness remains, one is in doubt whether to attribute it to the waxing or to the nitrate bath, to the time of exposure in the camera, or to the prolonged action of the gallic acid. As to the paper mentioned, we may expose it a very long time to the gallic acid, until we find all the details, even the least illuminated parts, well indicated; and the impression, after having been fixed and dried, having lost almost all its transparency, regains it completely by waxing.

It must not be supposed from this that the time of exposure in the camera is of slight importance; neither do I wish to contest the superiority of waxed paper; only this latter, if all its advantages are to be brought out, is more difficult of employment, inasmuch as we do not so easily find out the causes of failures, so as to regulate the operations, and particularly the time of exposure and of the action of the baths.

Perhaps waxed paper will be found more economical in regard to the consumption of nitrate of silver, than sugar of milk paper, because the same solution, after having been used, may be preserved a long

time for other preparations. But this solution cannot be used up entirely, because it becomes weakened; moreover, in changing one's place on a journey it is best not to carry nitrate of silver in solution; a violent and continued motion spoils it. Besides if we do not pour out more than is requisite to cover the sugar of milk paper readily, no great quantity is consumed. It is true the amount is considerable if we take large pictures; but what remains is very suitable for the gallic acid bath after having been diluted with distilled water. Lastly, it remains still to be tried whether the same solution, although it becomes brown after the bath with albumen or serum paper, may not still be used several times. I have made an experiment which proves this possible, at least for positive paper; I have printed several positives on paper prepared with albumen; the papers which I placed in a solution of nitrate of silver which had already been used, and which had subsequently become of a deep brown color, almost black, were still good, for some objects, even preferable to paper prepared on a new bath, because the whole of the paper receiving a more yellowish tint, the whites of the positive impressions were a little moderated.

The observations I have just made in this letter, are not intended to cause an unfavourable opinion of waxed paper; and

as I do not think that photographers who have applied it successfully will abandon it, it will perhaps be agreeable to them to learn a process of waxing frequently adopted in Germany for waxing finished negatives, but which is also quite applicable to waxing paper not prepared; this process appears to me much less tedious than the mode of waxing employed by M. Le Gray.

The white wax, usually found in round plates, is made into the form of a taper, so as to be more manageable. Instead of melting the wax in a dish plated with silver, a plate of polished metal heated by a water bath may be employed. On this is placed the paper to be waxed; the wax is moved over this; it melts instantly, the paper being held, for instance, by means of a cork, the superfluous wax is removed by means of blotting paper or clean linen. In using a spirit lamp instead of a charcoal fire, there is nothing to fear from the heat or the vapor of charcoal.

This method of waxing appears to me to offer much facility and saving of time. Hundreds of larger sheets may be thus waxed in a day, and moreover by this method there is more certainty of obtaining an uniform layer of wax than by the employment of a hot iron.

F. A. OPPENHEIM.

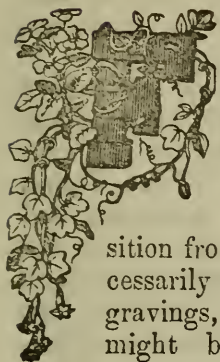
Dresden, March 17, 1853.

GELATIN.—A concrete animal substance, composed of 47.881 parts carbon; 7.814 of hydrogen; 27.207 of oxygen, and 16.998 parts nitrogen. It enters largely into the composition of many of the animal solids, and is readily distinguished from all animal principles by its easy solubility in boiling water. The cold solution assumes the appearance of a semi-transparent jelly; one part of it in 100 of water becomes

solid on cooling, which is called hydrate of gelatin. Isinglass is the purest form of gelatin, and is formed from the sounds of fish, more especially the sturgeon. Gelatin is insoluble in alcohol, but very readily dissolved in dilute acids. A hot solution of gelatin applied upon paper at the same time as the iodide and other salts, produces a sizing, very excellent for photographic purposes, and insoluble in cold water.

From the Illustrated Magazine of Art.

ENGRAVING AND PRINTING ON COPPER.



FROM the earliest ages of the world the representation of natural objects by means of pictures, has been one means by which ideas have been communicated from mind to mind. The transition from pictures, which must necessarily be single objects, to engravings, by which the pictures might be multiplied extensively, seems natural enough—just, indeed, as printing from wooden or metal letters seems the regular and natural advance upon manuscript transcriptions. Thus, engraving may be considered as only another kind of printing—the design, executed on plates of copper, steel, or other substances, standing in the same relation to the picture as the metal types of the printer do to the caligraphy of the writer.

HISTORY OF COPPERPLATE ENGRAVING.

By the word engraving, we understand the art of executing designs upon copper or any other material, from which impressions or “prints” may be taken. It is usual to speak of its discovery as cotemporary with that of printing, but in some sense the art was certainly known to the ancients; and our only wonder is, that so many years should have elapsed before its applicability to printing should have suggested itself. It is not, however, necessary to speak of the art of engraving as it was known to the ancients,—though we might refer, properly enough, to the writings of Moses for proof that engravings on seals and signets were known to the Egyptians; we might also speak of the numerous relics we possess in the British Museum of Etruscan, Grecian, and Roman art; and enter into a long description of the art of engraving on gems and metals, as it was known in India, China, and on the continent of Europe before the Christian era. But as our proper business is with the mechanical process of engraving

on copper for the purposes of printing, we refrain from entering into these interesting particulars.

The invention of engraving, like that of printing, seems to have been the result of a kind of accident. Tradition attributes it to the Florentine goldsmiths of the fifteenth century. It is supposed that these artisans, or rather artists, while taking impressions of the subjects they had engraved either on metal plates for the purpose of ornamenting furniture, or on gold and silver plate emblazoned by their hands, perceived that as the black, which remained at the bottom of the lines, was readily taken off by clay or wax impressions, it might also be easily taken off upon paper. This first step was soon followed by a second, which was again quickly followed by others, and thus it was that the beautiful art was invented.

The invention of printing naturally gave engraving a new direction; and the engraver, hitherto a mere chaser and ornament of metals for domestic use, rose at once into the rank of teacher. The first prints were obtained from wood blocks engraved in relief. The earliest specimen of wood engraving known is one dated 1423, representing St. Christopher; but no impression from an engraved metal plate has been found of a date anterior to 1461. So that the art so common now has not yet celebrated its four hundredth birthday.

Tommaso Fineguerra a Florentine goldsmith, is said to have first practiced the art of engraving on metal plates, for the purpose of printing, about the year 1460; but the credit of the invention has been of course claimed by others; the Germans—anxious sticklers for everything likely to advance the fame of their “faderland”—put in their claim, but it is generally considered that the art was first practiced in Italy, and had its origin in the workshop of the goldsmiths. Many of these goldsmiths were *niellatori*, or workers in *niello*—a mode of ornamental engraving usually per-

formed on silver plates—the design engraved on which was afterwards filled in with a black composition.

This practice of his art naturally suggested to Fineguerra the possibility of taking an impression from the engraved design with ink on moistened paper.—When once established, the new art was eagerly taken up by Baldini, Botticelli, Pollajuoli, and Mantegna; and in Germany by Martin Schoen, Israel van Mecheln, Leydenwurf, and Wolgemut. The first book printed at Rome (an edition of Ptolemaeus's Geography) was illustrated by the first *plate engravings*, twenty-seven in number, which were maps, and were executed there by two Germans, Sweynheym and Buckink. The work is dated 1478, but was commenced in 1472. Another early work was an edition of Dante's "Inferno," published at Florence in 1481, and embellished with engravings by Baccio Baldini, after the designs of Botticelli.

One of the best engravers in Italy in the early part of the 16th century was Raimondi, who studied under Francia and Raffaello. His great merit lay in the correctness and beauty of his outline. He engraved many of Raffaello's pictures, which he copied with great truth, although defective in respect to light and shade. He was succeeded in Italy by Agostino de Musis, Marc de Ravenna, Caraglio, Giulio Bonasoni, and Enea Vico, all pupils of Raimondi: George Ghisi of Mantau, and his relatives Diana and Adam Ghisi, Cornelius Bort, &c. The principal painters who have practiced engraving in Italy are Agostino Carracci, Stefano della Bella, Spagnoletta, Guercino, Salvator Rosa, Claude Lorraine, Swaneveldt, Canaletto, Piranesi, &c.

In Germany engravings made more rapid strides towards excellence, in the mechanical parts of it; and at the commencement of the 16th century appeared Albert Durer, a man whose universality of talent extended the boundaries of every department of art, and carried all to a degree of perfection previously unknown in that country. He had great command of the graver, and carried his plates to a much high degree of finish than his Italian contemporaries. He is also believed to have invented the art of etching by corrosion: three of his specimens are dated 1515, 1516 and

1518 respectively. On examining the etchings of Albert Durer, we see that they have all been corroded at one "biting-in;" which sufficiently explains their monotonous appearance, and proves that "stopping out" was not then understood. The principal German engravers after Albert Durer, are Aldegraver, the Behams, Altdorfer, Bink, Penz, Solis, &c.

Lucas Jacobs, best known by the name of Lucas van Leyden, was the father of the Dutch and Flemish schools, and the contemporary and friend of Albert Durer. After Van Leyden the art was maintained in the Low Countries by the Wierinxes, the Sadeliers, whose works are multifarious, and embrace every class of subject; the old and younger Jode, Cornelius, Theodore and Philip Galle, Abraham and Cornelius Bloemart, Goltzius, Spranger, Muller, Lucas Killian, Matham, Saenredam, and the two Brothers Bolswert. Many of these introduced improvements in the art. To mention the artists of this school from whose hands we have etchings, would be to name all the most eminent painters belonging to it; Rembrandt, Berghem, Cuyp, Karel du Jardin, Paul Potter, Ruysdael, Ostade, Waterloo, Adrien Vandervelde, with many others.

In France engraving has been practised with pre-eminent success in the departments of history and portraiture. The celebrity of the school dates from the time of Louis XIV. The family of the Audrans produced six eminent engravers; but of those the most distinguished was Gerard Audran, who was the first engraver who successfully united, to any extent, the use of the graver and the etching point. Gerard Edelineck, although born at Antwerp, may be fairly considered of the French School, and was an engraver of the highest order. In portrait Nanteuil is no less celebrated than his contemporaries. The Drevets, John Louis Roulet, Le Clerc, Simoneau, Chereau, Cochin, Dupuis, Beauvais, Balechou, Le Bas, John George Willie, are among the best of the French engravers.

The English school of engraving dates only from about the middle of the eighteenth century, previous to which those who practiced the art in England were chiefly foreigners.

Hogarth engraved many of his own designs. Francis Vivares introduced the

favorite art of landscape etching; he, Wollat, and Browne, produced some of the finest landscape engravings extant. Sir Robert Strange excelled in portrait engraving. Mezzo-tinto engraving, although not strictly born among us, has been in no other country practised with a degree of success at all approaching that attained by M'Ardell, Earlom, Smith, Valentine Green, and others. Bartolozzi, Ryland, Sharpe, Paul Sandby, Middiman, Milton, Fidler, and Raimbach, are among the most eminent of deceased engravers.*

The fifteenth and sixteenth century saw this art attain great perfection; this is incontestably proved by the *chefs-de'œuvre* left by the old engravers; and the present and two preceding centuries have merely modified some of the old processes; though doubtless, there are living at the present day some of the best and most artistic engravers the world has yet produced. It would be invidious to distinguish any by name; and our space would not allow us to give anything like a list of them and their works. The American school of engravers has yet to be formed; but the progress our artists are daily making leads us to hope great things of them.

PLATES FOR VARIOUS PURPOSES.

Copper, steel, zinc, or pewter plates, about the twelfth of an inch thick, are indifferently used for engraving upon. Steel is at present the metal most generally used, as the number of impressions which can be taken from it is very considerable. Copper is preferred for subjects of which fewer copies are required, zinc for plans or maps of very large dimensions, and pewter is the metal generally employed for music plates.

THE TOOLS EMPLOYED IN COPPERPLATE ENGRAVING.

Copperplate engravings, such as are usually employed in the present day, are the result of two distinct processes; first, by direct incision of the graver, or of the dry point, and the next by corrosion with aquafortis. The instrument called the graver or burin, differs in size, shape, &c., according to the character of the line which it is intended to produce, but the ordinary graver is of the form of a quadrangular prism,

both square and lozenge-shaped, and fitted into a short handle, the whole being about five inches and a half long. The square graver is used in cutting broad lines, and the lozenge-shaped for more delicate ones. In making the incision it is pushed forward in the direction of the line required, being held by the handle at an angle very slightly inclined to the plane of the copper. It is requisite that the graver be well tempered, and great address is necessary in whetting it for use. The angle at the meeting of the two lower sides of the graver forms what is called its belly, and the breadth of the end is called its face. The two sides which form the belly are to be laid flat upon the oil-stone, and rubbed firmly until the belly slightly rises, so that if it were laid flat upon the copper the light could be seen underneath the point; otherwise it would be impossible to use it with freedom, as it would dig unequally deep into the copper. The face is next to be whetted, which is done merely by laying the face of the graver flat upon the stone, with the belly upward, and rubbing it steadily upon a moderate slope until it acquires a very sharp point, taking care that the stone be properly supplied with oil all the while. The graters sold in the shops are commonly too hard for use, which is known by the frequent breaking of their points; when this is the case they should be tempered by holding them on a red-hot poker, at a distance of half an inch from the point, until they acquire a faint straw color; they should then be put into oil to cool; or they may be tempered with a candle, and cooled in the tallow. But it is best not to be hasty in tempering; for if the graver is only a little too hard, whetting alone will frequently bring it into good condition. An instrument called a *scraper* is required to scrape off the barb or burr which is formed by the action of the graver and dry point. The *burnisher* is used to polish the plate and to erase any scratches which it may accidentally receive, and also to make lighter any part of the work which may have been made too dark. An *oil-stone* is requisite for sharpening the instruments upon. *Etching-points* or *needles* are nearly similar in appearance to sewing-needles, but fixed into handles four or five inches long; some are made of an oval form, to produce broader lines with. *Dry*

*Knight's "Cyclopædia of the Industry of all Nations."

point is, in fact, nothing more than the common etching-needle brought to a very fine point. It is used to cut or scratch the more delicate lines with, such as skies, &c., &c. It does not, like the graver, cut the copper clean out, but throws it up on each side of the line produced by its progress through the metal: this is called the burr, which is removed by a scraper. This burr was left on by Rembrandt, until it wore away in the progress of printing, which it soon does; but by his management it added greatly to the effect of the etching, and impressions from his works with the burr on are much valued. A *cushion* is a bag of leather filled with sand; its use is to support the plate so that it may be freely turned in any required direction; but is not now much used by artists, being chiefly confined to engravers of writing. A *rubber* is a roll of cloth tied up tight, one end being kept in olive oil. It is useful to polish off more completely the burr, and also to show the appearance of the work as it proceeds.

THE COMPLETION OF THE ENGRAVING.

Having thus explained the nature and uses of the tools in copperplate engraving, we shall soon briefly attempt to show how the engraving is brought to a state of completion. The outlines of the subject to be represented, with the form and place of the lines which are to shade the engraving, are lightly traced on a steel or copperplate. Then a graver, corresponding in size and form to the lines required to be traced, is pushed forward, like a gouge, to cut the plate, by which means little strips of metal are scooped out. The strokes or lines, which are gradually increased in number near to one another, produce according to their position, their relative approximation, and their thickness, tints more or less varied, and the *ensemble* of the most perfect engraving is nothing but the *ensemble* of these strokes.

This process, which appears at first so extremely simple, is, however, excessively difficult to perform, and no one becomes master of it until he has served a long apprenticeship, and minutely studied all the mysterious difficulties of his profession. With respect to what is purely artistic, the acquirements necessary for one are also necessary for all kinds of engraving. The

successful engraver must be an artist. There are some engravings which have only been terminated by the most assiduous labor of ten, twenty, or even thirty years. We even hear of a few plates which have each occupied nearly the entire life of an engraver.

Copperplate engraving is thus seen to be an assemblage of hollow strokes, forming a number of little furrows destined to receive the ink which is to be conveyed on to the paper, in order to produce an impression. Now, whether a plate has been engraved with the burin, or finished by corrosion with aqua-fortis, or by means of any other process, its surface always contains hollows for the reception of the ink which is to be conveyed, by means of the press, on to a sheet of paper—in this respect differing altogether from wood engraving, in which all that is cut away from the surface of the block appears white in the impression.

COPPERPLATE PRINTING.

We now come to the next stage of the operation—the printing from the copper or steel plates thus engraved on. The design being “proved,” that is, impressions being taken from it to show that it is sufficiently well engraved to “go to press,” the plate is inked over, and then passed between the cylinders of the press, by which means all the ink upon the plate is transferred to the wetted paper laid upon it.

The mechanism of a press is very simple, and yet few persons have a true idea of it. It consists simply of two cylinders or rollers, supported in a strong wooden frame. The cylinders are moveable on axes, one being placed just above, and the other just below, the level of the table on which the plate to be printed is laid. The upper cylinder is turned round by the arms of a cross fixed to its axes; though in some of the more modern copperplate presses, a lever of greater power is employed; but it must be stated that the rollers may be brought closer or otherwise to each other according to the amount of impression; or rather, the depth of blackness required in the engraving. The means taken to move the cylinders higher and lower are very simple, being nothing more than the insertion of pieces of card-board into the longi-

tudinal slits in the framing of the press, which cards act as a kind of slight spring during the action of the cylinders upon the plate between them.

The plate, then, has first to be inked. The printer to whom it is confided places it on a sort of box, the top of which consists of a plate of sheet-iron, and in which is placed a pan filled with lighted charcoal dust. When the plate has attained a certain degree of gentle heat, the printer removes it from the charcoal box, and covers it as equally as possible, by means of a dauber, with a light layer of brayed black, or copperplate ink.

Inking the plate is an operation requiring great care and no small degree of skill, as, if too much or too little ink be employed, the impression is greatly injured, if not entirely destroyed. Among the copperplate-printers this kind of ink is technically called "black." It is composed of very thick boiled oil, mixed with a proper quantity of Frankfort charcoal, produced from twigs. Of course, there are many varieties of copperplate ink, and many printers prefer to prepare their own.

This "black," being slightly liquified by heat, enters the most superficial cuts on the plate. A piece of course muslin is then taken by the printer, and, by rubbing it on the engraving, the black is made to enter all the lines, while the superfluous color is, at the same time, removed from the surface of the copper, which is polished bright by similar means. The printer, lastly, uses the palm of his hand to wipe off whatever black remains on the surface of the plate. This is a very delicate, though not a very clean operation; a clever workman leaving all the lines of the engraving filled with ink, while the plain parts, which are intended to appear white in the impression, are made bright and smooth by the manipulation of his hand, assisted by a little whiting.

The engraving is now placed on a large walnut-tree board, where it is covered with a sheet of damped paper, and four or five pieces of blanket, the texture of which is something between flannel and cloth, are placed on the sheet of paper. These blankets are of course fixed to the upper cylinder of the press.

The plate, paper, and blankets are then

passed between the rollers of the press. The workman, taking one of the arms of the cross in his hands, fixes his foot against the frame of the press, and by dint of sheer bodily exertion forces the whole through the cylinders, and thus produces the impression required.

The rollers, or cylinders, are composed of walnut wood, *lignum vitae*, or steel; and as they are very close together, the leverage exercises enormous pressure. Indeed the philosophy of the process is simply that the pressure employed acts upon the elasticity of the cloth and forces the moist paper to enter the lines in the plate and to take up all the black ink from it.

The proof is then removed from the plate; and this quick and wonderful operation, which can be repeated as often as required, presents us with the innumerable impressions which ornament our books, our houses, and some few of our public galleries.

We have most of us heard of "artists' proofs," "proofs before letter," "India paper proofs," and "early copies" of engravings, many of which are sold for large sums of money: but not many non-professional readers quite understand the meaning of the several terms. We will enlighten them. "Artists' proofs, then, are some few, taken with peculiar care, —under the the immediate inspection of the artist himself,—upon India paper; they are sold with the autograph of the painter or engraver attached, as a guarantee of their value. "Proofs before letters" are impressions carefully taken on India paper, immediately after the artists' proofs, at the ordinary press, and before the plate has had the inscription attached to it by the writing engraver. "India paper proof" are simply copies printed on India, instead of the usual unsized cartridge paper; and "early copies" are what their name imports—though all these terms are liable to great abuse. The India paper is accurately laid on the wetted sheet of cartridge, and both together being passed through the press, the pressure exerted is sufficient to attach them inseparably together, the dampness of the cartridge slightly softening the size-finish of the India paper. As a proof that nothing should be wasted, it may be men-

tioned that the fine tissue-like paper so much valued, is made from old ships' ropes and tarred cordage!

BRIEF NOTICE OF THE ETCHING PROCESS.

As we shall have to speak more fully on another occasion of the aqua-fortis process, we conclude our notice with a brief account of the manner in which what is called etching is performed. As most persons know, and as we have before stated, etched is the super-addition of the "chemical process to drawing, when performed on a plate of copper over which a substance called the 'etching-ground' is laid."* This etching-ground is composed of wax, asphaltum, gum mastic, resin, &c., incorporated by melting over a fire, and capable of resisting the action of aqua-fortis. The *laying of the ground*, as it is called, is thus effected:—The plate must be heated over a charcoal fire, so that it may not be smoked. For this purpose a hand-vice is fixed to the most convenient part of the plate, by which it may be held in the hand. A piece of the etching-ground, rolled into the form of a ball, and tied up in a little silk bag, is then rubbed over the surface of the plate, the heat of which causes the ground to melt and come through the silk on to the copper. In order to effect a more equal distribution of the wax, a small dabber made of cotton wool, tied up in a piece of taffety, is quickly dabbed all over the face of the plate while yet warm, so as to leave the wax or etching-ground of uniform thickness; the ground is then rendered black by being held over the smoke of a wax candle, or, if necessary, two or three wax candles tied together, care being taken to move the plate about, so that it be equally smoked over; and this operation of smoking must be commenced before the plate has had time to cool. The whole operation of laying the ground requires address and dexterity. When cold, the plate is now ready to receive the design. To transfer the design to the copper, an outline is made with a black-lead pencil on a piece of thinish and even paper, and laid with the

face downwards on the etching-ground; the whole is then passed through a rolling-press, the effect of which is to transfer an impression of the outline on to the smoked ground. After this the design is completed with the etching needles, which remove the ground from the copper wherever they pass, and expose it to the action of the acid during the process of biting in, which is thus performed:—A substance called *banking wax*, which when cold is quite hard, but which on immersion in warm water becomes soft, and may be moulded into any form, is first rendered soft by being so immersed in warm water, and then banked up all round the margin of the plate, so as to form a trough capable of preventing the escape of the acid, a gutter only being formed at one corner for the purpose of pouring it off when requisite. This being done, the nitrous acid, reduced with water to the proper strength, is poured on, and its action on the copper becomes visible by the rising of innumerable bubbles. The aqua-fortis must be allowed to continue on the plate until the fainter parts are supposed to be corroded sufficiently deep; after which it is to be poured off, the plate washed with water, and left to dry. The parts which are bitten-in enough are now to be covered with what is called *stopping-ground*, which is a mixture of lamp-black and Venice turpentine; this is applied with a camel-hair pencil, and allowed to dry. After this the plate is again warmed, when the border of wax may be readily taken off. It is then made warm enough to melt the ground, which is removed by being wiped with a rag and a few drops of olive oil. The work is now complete, unless it is intended to finish it still further with the graver. We might here offer rules for the strength of the acid, and state the length of time it ought to remain on the plate, but we are convinced of the inefficacy of such instructions. Nothing but experience joined to some chemical knowledge of the effect of the acid will avail the artist on this point, which requires the greatest nicety and attention.

* Penny Cyclopædia.

MORAL REQUISITES OF THE EMINENT DAGUERREAN ARTIST.

Extract from a manuscript volume soon to be published.



R. EDITOR:—I have, several times alluded, in my previous disquisitions in your journal, to the deplorable traits of jealousy, inter-alienation, scandal and back-biting, prevalent throughout the Daguerreotype body. Having, as I think, sufficiently,—at least for the present,—discussed the *negative* side of this topic, I would now say something of its *positive* side. That is, I would speak briefly of what I esteem the *moral* qualities, which go to the making of a daguerrean artist of the highest class.

I need but simply name the truism, that the human spirit is a unit, the intellectual and moral portions, the head and the heart, the thinking and feeling elements, incessantly inter-acting, or acting and reacting on each other. A disease or derangement in the one instantly, by the operation of an organic law, is communicated to the other; disturbing, if not altogether suppressing the movement of this other. Hence it is, that to the fullest and most potent action of the spirit, both its elements, the thinking and the feeling, should be in a perfectly sound and healthful condition.

Now, at the outset, let us note first impressions, before consideration and reflection have had time to reach logical conclusions. What would you think of a clergyman, whose week-day *habits* were in total and violent contrariety to his Sunday homilies, whose tongue was prodigal of vituperation, slander and jealousy,—each and all a mortal infraction of that "*Charity*," which he, on every recurring Sabbath, and yet oftener, declared to be greater and more indispensable, than both "*Faith and Hope*?" You would be shocked to the core, and would say at once, that the pulpit was the very last place, in which *that* man should stand.

What, again, would you think of the Judge, whose function was, for a majority of the days in the annual three hundred and sixty-five, to dispense strict, impartial

justice between man and man, who, when off the "bench," should absolutely *signalize* himself by fraud, underhand, crooked dealings, and lying, scandalous tale-telling about his fellow citizens! Once more you would be completely shocked, and would say, that *he* ought to vacate the chair of Themis, even though the irregularly elected "Judge Lynch" must be summoned for the purpose.

Apply these illustrations to the Daguerrean artist. What is *his* office? By aid of the sun, that most faithful of all existing types of the ineffable source of life, he transmits to the metallic or paper surface, the beauties of the works of man and the works of God,—more especially that unitary aggregation of the Divine performances, the face and form of man. Working, with such instrumentalities, upon such materials, and for such ends, how mortal the incongruity of a low, base and filthy *moral* condition in the performer! Strictly, rigorously viewed, an unjust, unvaracious judge or an immoral clergyman is no greater, nor a more glaring anomaly on the bench or in the sacred desk, than such an operator in a Daguerrean Gallery. What *right* has a self-deformed self-marred spirit to commune with and endeavor to reduplicate the beauty that illumines the creations of the Divine Hand, or their imitations, the beautiful works of man? His sole befitting place, until cleansed of his stains by the waters of a *genuine penitence*, is amid circumstances, that correspond and reflect his own inward taste.

Somewhat like these would I think, be the first impressions of any sound, pure mind on a sudden presentation of this case to it. On reflection, however, and a thorough examination of the matter, a great deal suggests itself *confirmatory* of these first impressions.

Thus, a "house divided against itself" cannot stand. An inter-insurgent city is in momentary danger of capture by its assailants. So it is with the spirit. To transcribe *accurately* the works of God, or the forms of the beautiful, from whatever origin, the

faculties of the artist must be a well-compacted *unit*, and this unit must be in the closest sympathy and accordance with the spirit and significance of the objects or scenes, which he reproduces.

A malignant, or otherwise debased mind stands in absolute antagonism to that beauty, whose source and framer is God. The artist, thus conditioned, must work with the head alone, and not with the heart in junction with it; with the *intellectual* powers not merely in divorce, but in quarrelsome activity against them. It needs but a momentary glance to see, that such an operator is laboring with the noblest and most forceful faculties of his being, not simply in *abeyance*, (which of itself were unfortunate enough,) but in positive and mortal hostility to the *operating* functions. What *must* you anticipate and what must of *necessity* flow from such a condition of things, but a marred, imperfect performance? It is as though one should endeavor to run a race with fetters on his limbs, or to breast a raging torrent with one leg and one arm stricken lifeless with paralysis! No! To achieve eminence in art, or in anything else, the head and the heart must *both* be sound, and in complete accord.

Thus far I have spoken in general terms, and summarily to this effect, that the Daguerrean, like all other artists, can attain the loftiest eminence in his profession, only when his intellectual or operating functions are instigated and fortified by a pure and healthful heart or moral condition. Now, as the sole purpose of this essay is to benefit (if I can) my brother daguerreotypists, I trust they will pardon me for dwelling, a few moments, on certain items, which, if cared for, will aid in securing both the artistic excellence, and the social popularity of the operator.

For example, amenity, cordiality, ease and grace of manners, or to say all in one word, *politeness*—are well worth assiduous cultivation by the daguerreotypist. Indeed this quality, for its multiform and incalculable good effects, comes very nigh deserving to be noted in the category of *positive virtues*. An exterior prickly and touch forbidding, as the husk of a chestnut, may render repulsive, and spoil of three fourths of their *proper* influences, the rarest

and soundest virtues of character. Conversely, a gracious, winning manner may give social currency and universal popularity to a man whose moral blackness would be seen and read of all men, if, according to the wish of the ancient sage, "a window were placed in every breast." Nothing could vindicate the worth of this attribute so triumphantly as this single fact.

But this so desirable, so indispensable politeness is not a mere external thing—a garment, which may be donned and doffed at the pleasure of its wearer. It is the outgrowth and representative of internal dispositions or qualities, and these last must be cherished and assiduously cultivated in order that the former may be genuine and ever operative.

Among these qualities I would name, as first in importance, benevolence, or what the scriptures entitle love to man, or charity. With the theological significance or relations of this principle, the present is not the place to meddle. My concern now is with certain modes, in which it manifests itself outwardly.

One of these is a genial, habitual good nature. This quality we may pronounce all but indispensable to the successful daguerreotypist. A genuinely sunshiny face is a positive benefaction wherever it appears. It heightens the cheerfulness of the sitter, if already in good spirits, and dispels the gloom of one, who may be depressed and languid.

A sour, sullen face in the operator will go far towards neutralising his rarest skill, since it hardens into ice the very feelings, which should impart to the sitter's countenance the expression he would fain catch. It were the wisest policy for one of this saturnine, gloomy temper to

"Affect this virtue, if he have it not."

But the true and the only perfectly safe method, is to *have* it in the deed. It may, like any thing else depending solely on ourselves, be acquired by assiduous care and cultivation. And, in regard to this point, another matter is worth considering, that the very same disposition, which may be deemed essential to the eminence of the artist, is no less essential to his own personal happiness and that of all with whom he is connected either by affinity or

other ties. I might enlarge on this topic, but these hints are sufficient for the reader.

Patience is another quality, which the daguerreotypist, who would achieve eminence, should take special heed to make his own. I know few places, where this is more imperatively needed than in the operating room. The artist has all descriptions of people to deal with—the ignorant, the stolid, the flippant, the conceited wisecracks, the fastidious, the difficult, &c., &c. All these varieties of character demanding, perhaps, his attention and services successively in one and the same day, and perhaps the same hour, which would impose a tax upon his patience, not unfitly compared with that levied on Job himself by his boils, his friends and his “better half.” How many of these sitters will insist, despite your explanations and remonstrances, on being represented in this or that attitude,—one which you know, will have the effect to exaggerate every blemish of the countenance and throw into shade all its redeeming points? You yield to their pertinacity, and the result, as you were perfectly aware beforehand, is a picture which shocks the original and plucks down on yourself the reputation of being no artist at all! Every day you must anticipate being tormented by just such persons as these—utterly incapable of judging what is or is not an artistic performance, yet so puffed up in their own conceit, as to count themselves better judges than yourself. But it were idle giving way to impatience or irritation or contempt at these inflated simpletons. They constitute a large portion of those, by whom, if at all, you are to win your bread and rise to professional distinction. The wisest course is, to do the best you can with them, and to do this there is nothing more indispensable than the *patience*, of which I am speaking.

I have spoken of these two qualities, as the principal modes, in which, so far as the daguerrean process is concerned, that benevolence manifests itself, which constitutes the fountain of true politeness—which politeness I urged, in general terms, as a *sine qua non* of eminence in this noble art.

I know not, that it would be profitable to push this analysis further. I shall, therefore, conclude this paper by a few

miscellaneous observations, all bearing on the topic I have taken in hand.

I would, then, counsel a frank, friendly, cordial intercourse between all engaged in the same profession. Let there be as much and as active rivalry, as you will, with your brother artists. But let it be a kindly, honorable, generous rivalry, which scorns all backbiting, misappreciation, underhand dealing and attempts to injure or lower; but which, gladly admitting all a competitor's merits and attainments, only finds, in these, incentives to a noble emulation and a keen stimulus to fresh endeavors at self-improvement. Artists in every sphere may find, in a free, open-hearted interchange and communication of individual experiments and processes, incalculable helps towards individual advancement in their common profession; while, by standing in isolated, or still worse, in hostile, belligerent attitudes, sneering at, traducing and depreciating one another either professionally or morally, they not only rob themselves of the positive benefits above named, but they both injure themselves personally and degrade their profession in the public eye. No man can stand *higher* in the world through the simple fact of *lowering* another, nor can any one achieve the reputation of being eminent in his vocation by spreading abroad the belief, whether true or false, that another has no skill at all therein. Time is the one great, inexorable Nemesis, rectifying all mistakes, redressing all grievances, disentangling all meshes of falsehood, sweeping away all “refuges of lies,” plucking down the little, misbelieved great, exalting the great, misapprehended as little, and assigning to each the exact measure of his deservings. If, therefore, we would be *esteemed* eminent in our profession and enjoy the glory of eminence, let us *be* eminent in very deed and truth. It is the only sure way. But to accomplish this end will exact of us much hard labor, diligent study and long-continued, careful experimentation. The end, however, is worthy the means, and he that deems otherwise, has mistaken his vocation.

These hints on the moral requisites to eminence in the daguerrean art I have thrown together, as *topics of thought* for my brother artists. For *this* purpose they are

quite sufficiently expanded, and to enlarge upon them further were superfluous and might be tedious. In another paper, I may

say something of the *intellectual* requisites of the accomplished daguerreotypist.

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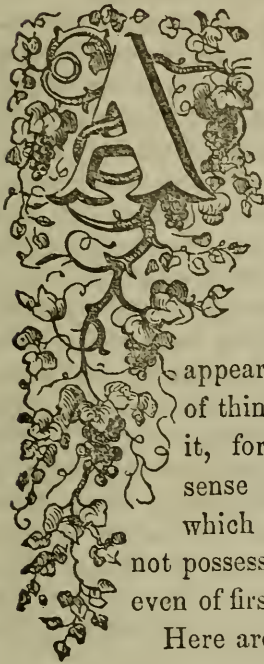
HYPÓSULPHITE OF SODA.—This salt is prepared by saturating a hot and concentrated solution of sulphite of soda with flower of sulphur; then by evaporating it the salt is obtained in beautiful crystals of a prismatic form. The solution of hypsulphite of soda is excellent to remove from the proofs sensitive matters which remain unaltered by light, chloride, iodide, bromide, cyanide, and fluoride of silver, &c. It dissolves them perfectly, and tends to form at the same time a sulphite of silver with the parts which have been reduced by the light. The formation of this sulphite is determined in a very energetic manner by the conjunction of hydrochloric, nitric, or acetic acid. Solutions of hypsulphite of soda which are charged with the salts of silver, are more suitable than others for giving dark tints to proofs which have been fixed. Hypsulphite of soda is the best fixative that can be employed, as well for negative as for positive proofs. The latter may acquire by its action alone every possible degree of tone, the richness of which in the hands of a skillful operator is unbounded. When the positive proof is weak, it will be advisable to put it for a few hours in an ordinary water bath. It is thus freed from the soluble salt of silver, without so much as attacking the parts impressed by light, forming the blacks. By this method, less time is afterwards required for the hypsulphite of soda to remove the salts of silver not impressed and the fixed image therefore will be found to possess more vigor than would be the case were it put immediately into the hypsulphite of soda. For fixing the image 1 oz. of the salt dissolved in a pint of water is quite sufficient.

CONTINUATING GLASSES.—In photography, a term applied to glass tinged with red or yellow color, and which by some inherent principle possesses the power of

continuing the darkening of the photograph after it has been removed from the camera, and placed under them. They are founded upon the principle that certain rays exist which are incapable of exercising primitively an action upon the prepared paper or plate, whilst their rays are well calculated to continue that action, when it has been begun by other rays. This important discovery was made by Mr. E. Becquerel, who gives the following directions for the use of the glasses. The plate is iodized and exposed in the camera about fifteen times longer than when operating with bromine water. On taking it out, carefully preserving it from the least ray of light, it is put into a kind of sheath covered with yellow glass, and exposed to direct solar radiations. The time for this exposition cannot be determined precisely; but the operation presents no difficulty for the operator can see through the yellow the progress of the action. The proof is, therefore, only withdrawn when the image has attained the desired intensity and tone. By this process, views may be obtained of exquisite delicacy of detail, and of a very peculiar tone. With the accelerating substances, the red glass must be used, but results have not been as satisfactory as with the iodine and the yellow glass.

HYPOCHLORATE OF POTASH.—The product is found abundantly in commerce, and is obtained on this large scale by passing chlorine through a cold solution of carbonate of potash. This solution diluted with as much again of water perfectly destroys the tints which spot the paper; it also fixes the proof perfectly, and imparts very agreeable tones. The hypochlorite of lime produces the same effect. We consequently obtain by these two bodies proofs in which the lights are well preserved

GOSSIP.



s we expected, the Crystal Palace Exhibition in this city, has already began to stir up the tender feelings of our daguerrean artists. Although, at the first glance, this would appear a melancholy state of things, we are glad to see it, for it evinces a keen sense of artistic reputation which we were fearful was not possessed by the majority, even of first class artists.

Here are a few nuts to crack; those who chose to swallow the kernels can do so—we know of several who have attempted to serve the shells in the same way, but got most awfully scratched and choked in trying it. The article which we here copy for the amusement of our readers—for it can only amuse them, as they must perceive at once that the author is totally oblivious to the subject, scientifically, artistically, theoretically and practically—we presume it is only an epilogue to some great speech or dialogue that is to follow, and as it fully shows forth the ignorance of its author, we shall make no comments thereon—however, as a sequel to it, we give the answer to it by another writer, in the Times—thinking slyly to ourselves, though none shall know it—that there is too much good ammunition expended on a lame duck.

AMERICAN ART—DAGUERREOTYPES.—If there be any one department in the whole building which is peculiarly American, and in which the country shines pre-eminent, it is in that of daguerreotypes, which are exhibited below stairs; and the collection, which is an extensive one, is made up of contributions from almost every section of the Union where the art is practised. In

contrasting the specimens of art which are taken here with those taken in European countries, the excellence of American pictures is evident, which is to be accounted for by several reasons. In the first place, American skies are freer from fogs and clouds—from bituminous coal not being much used, the atmosphere of our cities is free from smoke, at least upon the Atlantic coasts. Then the chemicals and processes are, generally speaking, of a more sensitive character, and the apparatus is more convenient and suitable than that of Europe. Our little inventions come into play and aid in saving time and developing a good picture, and last, though perhaps not least, our people are readier in picking up processes, and acquiring the mastery of the art than our trans-Atlantic rivals. Not that we understand the science better, but the detail of the work is acquired in a shorter time by us, while the enormous practice which our operators enjoy, combines to render the daguerreotype art a necessary adjunct to the comfort of life. Does a child start on the journey of existence and leave his "father's hall," forthwith the little image is produced to keep his memory green. Does the daughter accept the new duties of matron, or does the venerated parent descend to the grave; what means so ready to revive their recollection? Does the lover or the husband go to Australia or California, and not exchange with the beloved one the image of what afforded so much delight to gaze upon? The readiness with which a likeness may be obtained, the truthfulness of the image, and the smallness of cost, render it the current pledge of friendship, and the immense number of operators who are supported by the art in this country shows how widely the love of sun-pictures is diffused. Several thousand industrious artists and artisans are occupied in the preparation of very pure chemicals, as bromine, iodine, gold salts, hyperphosphate of soda. Another class prepare silvered plates, cases, buffs, gilding, cut glass, and a hundred little addenda. Then the manufacture of cameras, and the grinding of good lenses is an important branch of the business; for without a camera having good lenses the best operator would fail to produce an

image which would be distinct and saleable; and even with a good Voigtlander or Harrison camera, it requires great skill to focus the image; for, strange as it may appear, the point where a good view of the sitter is obtained is not the point best adapted for bringing out a good picture. In other words, the focus of vision and the focus of chemical action are not the same, and hence when we have the one we lose the other. This is owing to the fact that it is not the rays of color on the solar spectrum which produce the image, but a different set of rays, viz.: those of chemical action; and since this is the case, we submit the opinion that it is not possible to obtain a daguerreotype in its *natural colors*, as Mr. Hill and others have been trying to delude our operators into believing, and leading themselves and others by the ignis fatuus of plates tortured into iridescent colors by chemical oxidation. But we are getting discursive upon this beautiful art, which was intended to subserve many other useful purposes than that of portrait painting.

Everybody knows how difficult it is to keep silver from tarnishing, and that the action of the light is to destroy all preparations of silver. Some of these are more readily acted on by light than others—are more *sensitive*, as it is termed. Such are the iodide, bromide, and chloride of silver. These salts cannot be kept exposed to light for any, even a very short time, without undergoing some change; and when a plate of silver has a thin layer of iodine and bromine on its surface, and is placed in a camera, as soon as the screen is raised the image of the sitter falls on the plate. The silver plate is acted on unequally, producing the effects of light and shade when *brought out*, as it is termed, by exposure to the vapor of quicksilver. It is then fixed or prevented from undergoing further change, by washing it with a solution of gold.

To produce a daguerreotype picture there are five operations necessary. The first is cleaning the plate. This is the stumbling block of most operators. They are not cleanly enough. Several views in this Exhibition show that the plates were not well enough cleaned. Never was a maxim more true than the old one, that “cleanliness is a virtue”—when it has re-

ference to daguerreotyping. The second is the formation of the sensitive iodide of silver over the surface of the plate. The third is the adjusting the plate in the camera-obscure, for the purpose of receiving the impression. The fourth is the bringing out the photographic picture, which is invisible when the plate is taken from the camera. The fifth, and last, is to remove the excess of sensitive coating, and thus prevent that susceptibility to change under luminous influence which would otherwise exist and ultimately efface the picture. The second operation is that which gives tone and warmth to the picture, and when performed by skillful hands, makes a daguerreotype a beautiful piece of art. The clearness and distinctness of the image is produced by the third process when carefully conducted, and the whole picture should be distinct over the whole plate. These remarks will serve to illustrate the subjoined notes upon the collections in the Exhibition.

Mr. Lawrence exhibits a case in which softness of the tone and distinctness of image are suited with artistic arrangement. The latter quality is specially noticeable in “The Three Ages.” The mechanical execution of these pictures is unexcelled. These pictures of Mr. L. are not very large, but there are a few very good pictures exhibited by him. In Gurney’s collection the coloring of the back-ground has a fine effect; there are some very well executed portraits, among which is one of Mr. Forrest, worth notice as a work of art: taken as a whole there is less softness and more distinctness in this collection than in that of Lawrence. The picture of Ware and his sister is an instance of a picture well developed when the chemical action extends to the margin of the plate. D. Clark, New-Brunswick, N. J., has four pictures of merit; and Van Schneidau a small collection of well-selected heads. J. Brown has a collection of portraits of Commodore Perry and the officers of the squadron for the Japan Expedition, in half-size plates: the interest of this collection is much marred by the names of the officers not being attached underneath the plate; it is not too late to rectify this omission. Haas has a whole plate allegorical figure of a family man reading the paper at home—an excellent idea and well executed. Besides

this, he has a couple of other pictures, though on the whole his show is mediocre. In the cases of Harrison & Hill there is displayed excellent artistic arrangement with very indifferent mechanical execution. In the mammoth plate occupied by allegorical designs, the back ground is wretchedly brought out—the plates were not properly cleaned, are full of scratches; there are a few half and whole-sized pictures set in gaudy frames.

Webster, of Louisville, Ky., has twenty-three pictures possessing clearness. They have, however, been exposed a little too much in the camera; they lack warmth, but are otherwise well developed and exhibit good mechanical execution. Alex. Hesler has a collection of whole plates handsomely executed, possessing a nice arrangement in this collection, especially evinced in the picture "Driving a Trade," one of a series illustrating character and passion. The panoramic views of Galena, Ill., shows that city to advantage; and the three views of the Falls of St. Anthony possess great merit. Mr. North, of Cleveland, O., has a case of pretty fair likenesses, perhaps exhibiting the lights too strongly. Bisbee, of Dayton, O., exhibits a panoramic view of Cincinnati from Newport, upon six large plates. This view is, without exception, the finest thing in the whole room; we might even go further, and say that it is the finest view by the daguerrean process ever exhibited. The mechanical execution is excellent, the perspective good, and the development unsurpassed. The effect of the smoke over the southern part of the city is very finely given. The distinctness of the letter signs, three-quarters of a mile distant and across the Ohio river, is well brought out. The rest of the collection is fair, possessing no peculiar merit. Williamson exhibits a poor collection. Dobyns, Richardson & Co. have several whole size well-executed specimens, in which the mechanical part, the artistic arrangement, and the chemical effect is good. The "Cupid Reposing" is a very ungraceful picture of an ill-formed child, and the coloring is bad. That of the Bateman Children, in character, is a good picture. There are some exceedingly well executed heads in this collection.

Long, of St. Louis, has four frames of 180 heads of Wyman's school, in that city, with the edifice and Principal; they possess no merit. A likeness of Prof. Mitchell, Cincinnati, is well executed. Some of the pictures in this collection are invested with papier mache frames inlaid with mother-of-pearl and tinsel. As this style of frame appears in a few other collections we may as well here express our dissent to the use of this material as being too gaudy and wholly unsuitable for daguerreotype plates. These latter are difficult to be viewed except in one light, and from the brightness of their surface, are much set off by deadened color on the frames, while the glare and iridescence of the papier mache add to the difficulty of discerning the picture; the use of such implies bad taste in the artist. We felt this opinion growing upon us as we looked at them and found our view corroborated by a boarding school miss, who whisked alongside of us and caught by the colors, exclaimed, "Oh my! aint those *frames* beautiful?" Fitzgibbon has the richest exposition in the Fair—the most expensive frames with a large and passable collection. The mammoth plate of Judge Colt is very good—that of Jenny Lind the best in the exhibition—those of McAllister, Julia Dean, Kate Hays and Kossuth, are good pictures. His collection of Indian Warriors, is a very fine one, which we understand is to be forwarded to the Ethnological Society of London, to have copies and busts made from them. Masury & Silsbee, Boston, exhibit twelve very pretty and tasteful plates, with good arrangement and well finished. Whitehurst has a few good pictures in a large and passable collection; he has ten pictures illustrating the Falls of Niagara, which are very well executed. Some of his large heads have their features out of all proportion. Whipple, of Boston, has a collection of photographic pictures, which he calls Crystalotypes, taken from hyalotypes; there is a plate of the moon daguerreotyped, and one of the spots on the sun. McDonnell & Co., Buffalo, have a very poor collection—so poor as not to deserve a place in the exhibition; the views of Niagara are fair. Hawkins exhibits photographs on paper. Drummond, eight plates of the Order of

Free Masons in their lodge dress. Fitzgibbon (already noticed) exhibits a very interesting case, which is a frame of electrotype copies from daguerreotype plates very beautifully executed. It should be looked upon as a mere curiosity to place a daguerreotype plate in a copper solution and take a copper cast from its surface by means of electricity: the copper cast looks much warmer in tone than the original. It is to be regretted that Fitzgibbon did not complete this frame by the insertion of a third plate, by taking a second copy from the copper copy. This would be in relief, like the original silver-plate, and is susceptible of being treated like an engraved plate; yielding, when inked, prints resembling mezzotint. Besides the above collection of daguerreotypes, there is an assortment of cameras, lenses, stereoscopes and photographic paper, which are of interest to those practising these beautiful arts.

CRYSTAL PALACE DAGUERREOTYPES *vs.* THE NEW YORK TRIBUNE.—*Mr. Editor*

My attention was called, yesterday, to a somewhat lengthy editorial upon the fifth page of the *Tribune*, under the caption of "American Art—Daguerreotypes," in which the writer, after endeavoring to explain the reasons why American operators were *inferior* to the artists of Europe, indulges his readers with a criticism that honorably entitles him to wear the mantle of ancient *Dogberry*, for the remainder of his life. I cannot, Sir, determine whether it were better to admire the conceited attempts he has made to induce the public to imagine him conversant with the details of an art, of which he apparently knows absolutely nothing, or his equally absurd attempts to represent himself partially acquainted with the vernacular of his mother tongue. The lack of grammatical accuracy which is seen in every line of his composition, renders him most unfit for the position he occupies as a reporter, and qualifies him to exclaim, with his ancient namesake, "But masters, remember that I am an ass; though it be not written down, yet forget not that I am an ass." It is not a fair and impartial criticism that I object to; but any sensible man would avoid the kick of a vicious donkey, were it in his power to escape the infliction.

M. Daguerre has, in common with other distinguished savans, admitted that American operators have *always* excelled. The best operators now in London, Liverpool, and Paris are *Americans*. So much for his first position.

The chemicals of this country, so far from being superior to those of Europe, are actually regarded as inferior for the purpose, and operators never use other than French or German chemicals, if they can avoid it.

In describing the necessary chemicals used by daguerreotypists, *Dogberry* alludes to certain articles that are now regarded as obsolete; comments upon others which are never used, and omits to mention the recent discoveries which have made the greatest improvements in the art. The logical deductions he presents exhibit an ignorance of the subject upon which he has written, rather than the calm and lucid researches of the scholar. He says:

"Our people are readier (?) in picking up processes, and acquiring the mastery of the art, than our transatlantic rivals. Not that we understand the science better, but the detail of the practice is acquired in a shorter time by us."

This is logical to say the least—*very* logical.

"A Daniel come to judgment! yea, a Daniel! Oh, wise young judge, how do I honor thee!"

Dogberry asserts that "it requires great skill to focus the image." So far from this being the case, I guarantee to instruct a child ten years of age, how to take a focus as correctly as the best operator in existence, *in less than five minutes*.

He says also: "The point where a good view of the sitter is obtained, is not the point best adapted for bringing out a good picture." These are the very points a skillful operator desires, by means of which he invariably produces good pictures.

Again: If the focus of vision, and that of chemical action, are *not* the same, as *Dogberry* asserts, why is it that operators are compelled to place the chemical surface of the plate, upon which the picture is to be taken, *in the exact spot* formerly occupied by the surface of the ground glass upon which the focus of vision was originally drawn?

Dogberry asserts, that "it is not possible to obtain a daguerreotype in its *natu-*

ral colors." Admitted. The same fact was stated in a written report presented to Hon. Horace Greeley in 1852, for publication, by a committee of daguerreotypists (one of whom was myself,) appointed to examine the alleged invention of Mr. Hill. Mr. Greeley refused to publish this fact *then*, upon the ground that pictures could be taken in colors—he having evidence of that fact convincing to himself. Mr. Greeley and his reporter differ very much in their views, or the *Tribune* philosopher has "changed opinions." There are other points I might prove entirely incorrect, but for want of space.

I again quote from the private opinions, publicly expressed of this sapient Dogberry:

"Mr. Lawrence exhibits a case in which softness of tone, and distinctness of image are united with artistic arrangement. The latter quality is especially noticeable in 'The Three Ages.' The mechanical execution of these pictures is unexcelled. These pictures of Mr. L. were exhibited in London."

All very true, but why not go farther and state that *these very pictures took the first prize medal* at the Royal Exhibition, and that Mr. Lawrence has always kept this most important fact before the public. And why not also state, with equal truth, that these pictures *were all taken by Gabriel Harrison*, and that every process, from the polishing of the plates to the finishing of each separate picture, *was performed by him alone*. A fair expression of opinion is all that is required by myself, and if these pictures of Mr. Lawrence now at the Crystal Palace, are really worth noticing, why not give the name of the operator *by whom they were taken*? It will be hard to believe that the operator who produced pictures in 1851, that beat the world, should, with two years' experience in his art, aided by an establishment which for luxury, beauty, convenience, and capabilities, may safely challenge any other in existence, produce a group of pictures possessing "very indifferent mechanical execution."

Harrison & Hill have no "gaudy frame" in which to exhibit their picture. The chaste and elegant frame in which all their pictures are placed, is from the manufactory of Waller & Kreps, Broadway artists, who have no superiors in Europe or Ame-

rica. It is a gem of workmanship—that reflects honor upon the mechanics who produced it.

Dogberry alludes to "a picture well developed when the chemical action extends to the margin of the plate." An unhappy allusion, as the picture contains but two figures, both of which are in the centre of a plate 10x12 inches only. Our pictures are, some of them, 15x18, and contain one hundred and fifty square inches more surface than any other plates on exhibition. More than this, the objects in the picture are carried to the extreme edge of the plate. These are facts not to be disputed.

Apologizing for the length of the communication into which I have inadvertently betrayed myself, permit me to remain, with the highest respect.

GABRIEL HARRISON.

— We are almost inclined to apologise for occupying our "Gossip" space with *such* criticism; but as most of our readers must be as fond of a good joke as ourselves, and as it will serve to relieve the oppression of this hot weather, we shan't do it.

— It is now but two months; to the time specified, for sending in the daguerreotypes to compete for the great Anthony Prize pitcher and goblets, and we trust those, at least, who have sent in their names as competitors, will not let the time pass unimproved. Remember that the daguerreotypes must be sent in by the *first of November next*.

— Remember, also, the next meeting of the N. Y. S. Daguerrean Association, on the second Tuesday in October.

Boston, Aug., 22 1853.

FRIEND SNELLING:—I send for the illustration of the September No., of your excellent Journal the Trachea or breathing tubes of the silk worm.

The insect economy is so different from all else, that it strikes one strangely when examining minutely their functions, beholding how wonderfully they are made, and how perfectly adapted are all their parts.

Insects, instead of breathing like animals have small orifices in the side which open and close at will, through which they inhale and exhale air for the purification of the fluids of the body.

This specimen, which I send you, is one of these openings with the innumerable little tubes attached, dissected from the other parts of the body, and magnified to the size here represented. The original scarcely covered the space of 1-8 of an inch. The daguerreotype from which this was taken, was executed in 1845. In my experiments, I used a triple achromatic lens, having a combined focus of one quarter of an inch and an aperture of 1-8 of an inch. The time of exposure was fifteen seconds. For one end of a camera box, several feet long, with a sliding box inside, fitted to hold my plate firmly, I fastened the small achromatic lens, while the object to be daguerreotyped was placed outside the lenses and in the focus with the sunlight condensed upon it by a larger lens. A beautiful image was given on the focus glass, seen in the back of the box at the distance of eighteen inches from the lens.

From my numerous experiments in microscopic daguerreotyping, I do not hesitate to say, that it is possible to imprint upon the silver tablet the most delicate microscopic delineations visible to the eye.

JOHN A. WHIPPLE.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST

FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

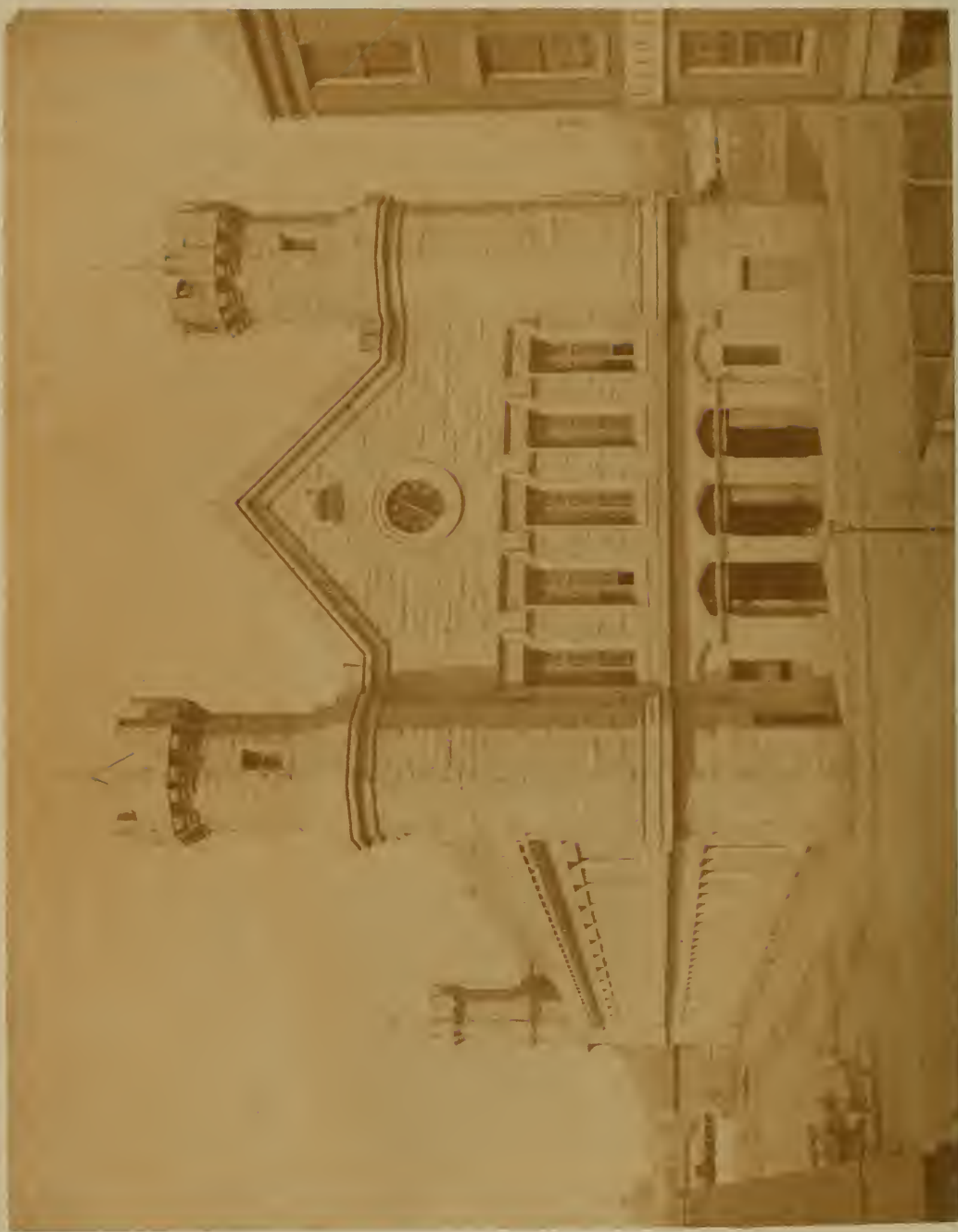
As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense. E. ANTHONY.



THE PHOTOGRAPHIC ART-JOURNAL.

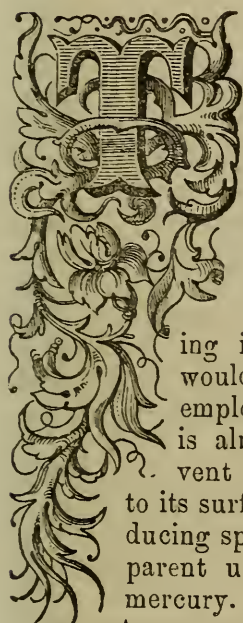
Vol. 6.

OCTOBER, 1853.

No. 4.

REMARKS IN RELATION TO PHOTOGRAPHY UPON METALLIC PLATES.*

From the French of Saint Germain-en-Laye, by J. R. Snelling, M. D.



THE plate being covered with a coating impregnable to light and well shut in its holder, should be placed as soon as possible in the camera. It could be delayed without doubt some hours, even until the next day without losing its sensibility; but it would always be better to employ it immediately, for it is almost impossible to prevent the dust from adhering

to its surface, or the air from producing spots which are made apparent under the influence of mercury.

A precaution must be taken here, which I cannot too much insist upon, with those individuals who may use, like myself, holders, with small openings furnished with double bands, to iodize or bromidize plates smaller than the box or basin; a quarter or sixth sized plate, for example, upon a box for a large plate; this is never to expose the plate in the camera in the same holder which is submitted to the coloring vapors. It is necessary to remove the plate from this holder, in the most profound darkness, and to put it in another holder perfectly cleaned by the spirit of wine or hypo-sulphite of soda, and well dried. Without this precaution we would obtain nothing but a detestable proof, and very frequently not the trace of an image will appear upon withdrawing it from the mercury box. It is probable that the fumes of iodine or bromine with which the wooden surface is

impregnated, spreads in the camera around the sensitive plate, and yields new combinations incompatible with the photographic phenomena. These remarks of course cannot apply to those who iodize their plates naked. The precaution which I am about to point out is useless when we operate upon large plates, for in this case the holder has no surface except that of the double bands upon which the plate lies, and these bands retain the iodine and bromine fumes, by which they are colored. They form nothing but an appendix, so to speak, of the same nature all around the plate.

The time during which the plate covered with the sensitive coating ought to be exposed in the camera, to the action of light, cannot be determined beforehand; it is necessary that each operator should profit by his own experience.

I will give some figures here strictly exact at the time of my last experiments, but made under other circumstances.

A view of the Church of Saint Germain-en-Laye and a part of the Chateau was taken in seven seconds, the average time of five proofs. I operated with an object glass of long focus made by Mr. Charles Chevalier, by a bright sun in the early part of October. The image corrected by a prism, entirely covered a large plate.

The same view and in the same conditions, but during cloudy and rainy weather was reproduced in twenty-five seconds, in the presence of Messrs. De Valicourt and Charles Chevalier.

A view of Notre Dame, taken from the quay of the Tournelle, with the sun, at 3 o'clock, in the evening, and in September last, was obtained six times in succession with uncommon clearness in seven and 12 seconds.

* Continued from page 141, vol. 6, No. 3.

The experiments with figures and costumes, made in one of the best glass turrets in Paris, but with thick fog, and without correcting the focal image, have given me desirable good proofs, upon half sized plates, in seven seconds at noon, 12 at 2 o'clock and 25 at 4, in the fore part of November.

At Athens, by a brilliant sun, it required from four to six seconds, to reproduce a view corrected upon a large plate, placing before the normal simple object glass a diaphragm with a centimetre opening.

EXPOSITION TO MERCURY.

When the plate is considered to be sufficiently impressed in the camera, shut the holder, and remove it with all the precautions necessary to preserve it from light. Place it immediately in the box with mercury, where the image--no apparent trace of which existed--makes its appearance and is developed under the influence of the mercurial vapor; light the spirit lamp, placed under the iron basin which forms the bottom of the box, and let the thermometer rise to 60 degrees. Extinguish the lamp, plunge into a bottle of sulphuric ether, the free extremity of the small glass tube (figure 20), or the roll of paper which may be used in place of it, let two or three drops of this liquid penetrate it, with a small piece of wood stop up the other opening of this tube, and introduce it through the hole made in the box of mercury, in such a manner that evaporation may take place just above the bulb of the thermometer. Let this fall to 25 degrees, and then remove the proof which ought to be well developed. It would be better not to examine it by the light of a candle while the image is forming. Some keep through the day, under their box of mercury, a lighted lamp, which constantly maintains the alcohol of the thermometer at 55 degrees. The proof may be removed, therefore, at the end of six or eight minutes.

A few operators make use of sulphuric ether recommended by Mr. Laborde, professor of natural philosophy at Corbigny; and by the way an etherized proof is much warmer, more sharp, and of a whiter tone than that which is not. If you wish to ascertain whether the ether has produced any effect upon the plate, you can examine it when it shall have been fixed with the salt

of gold; and, by making the visual ray to glide, so to speak, upon the surface of the plate, and by looking at it nearly upon a horizontal line, you will perceive the ether like a coating of grey ashes sufficiently thick under this angle, to mark the details in the demi-tints; but as clear as possible when the eye strikes it perpendicularly. It seems that, under the influence of the vapor of ether, the mercurial molecules are deposited upon the plate in new conditions, and, without doubt in my mind, wholly favorable to the beauty of the image.

Mr. Laborde also was the first to direct the iodizing as a method of dispelling the films of bromine which proceed from its excess; yet it is but justice to say that M. W. Thompson,* one of the most skillful operators that I know of, has rendered popular this method, which remained as it were in a theoretical state, until he made known its practical advantages. This is not, indeed, the only service which he has rendered to those who are engaged in photography, for he has given to the art of portrait making a remarkable impulse and contributed more than any other to the advancement lately attained.

The mercury ought to be filtered from time to time, through a fine linen cloth to free it from the coating of oxide which hinders the disengagement of its vapors.

WASHING WITH HYPOSULPHITE OF SODA.

Upon withdrawing from the box of mercury, the proof, if judged sufficiently fine to be preserved, (and consequently fixed with the chloride of gold,) should first be freed from the violet, blue or greenish coating imparted to it by the accelerative substances, and which offers resistance, apparently at least, to the light and the mercurial vapor.

The hyposulphite of soda is the salt employed for this purpose. Dissolve 60 or 80 grains of it in a pint of filtered water, and pass this solution through paper.

Take two basins of fine crockery or porcelain, they being better than those of metal. They might also be made of gutta-percha, which would neither be heavy nor fragile. In one, put enough of filtered water to cover the plate well; in the other,

* Mr. Thompson is an American, who has operated in Paris, for several years, and has always been highly spoken of.—*Ed. P. A. J.*

pour an equal quantity of the hypo-sulphite solution. Seven or eight millimetres in depth, given to these two liquids, will be sufficient and some over. Plunge the plate into the fresh water of the first basin, leave it for some seconds—25 or 30—then remove it horizontally by two of its corners, and place it in the same position at the bottom of the other basin containing the hyposulphite solution. The blue or violet coating fades and soon disappears, especially if you communicate to the plate a slight motion which constantly changes the relations of the plate with the molecules of the liquid. As soon as the plate shall have ceased to present the least shade of yellow, and all the iodine shall have disappeared, remove it by one of its angles, plunge it again in the water of the first basin, wash it freely with water, and place it upon the gilding stand of M. Ch. Chevalier, or upon other apparatus used for fixing proofs; but take care not to let any part of the surface get dry, under penalty of seeing produced a brown coating which would spoil your proof.

Another process still may be employed which is perfectly successful, especially for plates of small size. Expose them with the hand or by means of the plate nippers, and at an angle of 40 or 45 degrees, to the action of a jet of the hyposulphite of soda falling from the spout of a crystal fountain or from a decanter held in the other hand, and move the plates under this jet, in such a manner that the iodine may be dissolved and carried off by the same stream of hyposulphite; then wash the plate freely with water before fixing it with the salt of gold. The hyposulphite solution after it has been used can be poured into a vessel, filtered and employed several times more.

FIXING WITH CHLORIDE OF GOLD.

I have but little to say of this operation so well known to all. Cover the plate which lies upon the gilding stand with as much of the solution of the chloride of gold as its surface will hold. Equalize the thickness of this liquid coating by means of the gilding stand; heat it with a powerful spirit lamp by moving its flames very uniformly under the plates, until the proof, having first darkened, shall finish by becoming white and acquiring a great vigor of tone.

As soon as it is *good*, do not seek to make it *better*; if you do, you will be sure to spoil it. Withdraw the heat, wash it freely with water, cover it with distilled water and dry it with the lamp, holding it with the pincers if it be of small size, or with the excellent fork invented by M. de Brebisson, and frame it if you can immediately. It is useless, as I have already said, to previously remove the varnish which covers the back of the plate. The heat of the alcohol lamp sufficiently powerful to almost produce ebullition of the coating of chloride of gold which adheres to the plate, does not change the copal mixed with the chromate of lead, and this operation may be renewed several times without the least inconvenience.

The holes in the corners of the plate must be stopped with small pieces of wood, in order to prevent the chloride of gold from passing through, at the moment particularly when it begins to show the effect of the flame.

Finally, there is a degree of heat which must not be passed, on account of the danger which there is of the pellicle of silver becoming detached from the plate in small flakes which would swim upon the surface of the liquid. Again, the proof may acquire in some parts a milky film which can never be removed.

The salt of gold known under the name of its inventors, Fordos de Gelis, is extremely convenient, particularly in traveling, because it may be preserved indefinitely and it is easy to prepare in a few seconds the quantity which may be needed. We have merely to dissolve it in distilled water in the proportion of a gramme to 1 quart of water.

In regard to the excellent preparation for which we are indebted to Mr. Fizeau, it is always in my opinion the best of all, and seems to me to impart to proofs lighter and warmer tones than the others. Nevertheless, these two chlorides have each their advantages, and it is necessary to be abundantly supplied with the elements which serve to compose them. The solutions should be carefully filtered before being used.

The proof fixed with the salt of gold must be put immediately under glass, and excluded, as much as possible, from the air, dust and moisture, which could not

fail to alter it. With respect to light, it has no longer the least action upon the plate. Moreover, a proof must never be inclosed in a frame or passe-partout which is not perfectly dry; for if a little dampness remained from the gluing, it would produce immediately upon the proof indelible whitish spots, even with the cyanide of potassium.

In conclusion, I recommend to amateurs of photography into whose hands these notes may fall, the renewed silvering of the plates for every proof; the boxes with biscuit for iodine and the accelerative substances, the preparation of chloro-bromide of lime, the drops of sulphuric ether, the small cone inverted and hollow, by means of which we can ascertain the shades which affect the sensitive coating at the moment when it is formed; the proof of experiment upon the different combinations of silver, iodine and bromine obtained upon several compartments of the same plate; and the plate holder for polishing horizontally, movable upon its centre.

I request of them also a little indulgence for these hastily written notes; finally, I feel that I cannot too strongly impress upon every mind the importance of following my example, by making known the result of their researches.

SAINT GERMAIN EN-LAYE.

July 15, 1850.

EXPLANATION OF THE FIGURES.

The proportions observed in the design of the figures are not accurate. Some details and measures have been exaggerated in order to make the forms better understood. They are not of the same dimensions as given in the text; these have been faithfully calculated.

Figure 1* is a glass box or jar. The interior surface of the bottom of this box being convex at the centre, it is quite difficult to make the tubes or diaphragms of small diameter stand. We remedy this difficulty by placing inside on the bottom of the box a wooden ring, the opening of which is cut sloping, so that the wood and the most elevated part of the glass forms a level surface at the bottom of the box. The weight of the sheet of rolled copper and diaphragm is sufficient to keep it at

the bottom of the solution of sulphate of copper.

Figure 2* is the copper plate rolled up, furnished with an appendix and wire conductor turned into a spiral. The cylinder which it forms may be diminished in diameter by pressing it with the hand. It might be made almost to touch the diaphragm, and thus be the means of increasing the action of the pile, since the two metals, zinc and copper, would be brought nearer to each other.

Figure 3† represents the small gallery serving the top of the cylinder formed by the copper sheet. It contains the crystals of sulphate, intended to replace in dissolving the metallic copper, by restoring it to the rolled sheet, while the silver of the cyanide bath is on its part carried to the plate which is being galvanized.

To make it better understood, I have sketched it under two different aspects, —horizontally, to show how the crystals of sulphate of copper are placed; and taken upside down in order to show the series of small holes which permits the water saturated with the sulphate to communicate with the crystals. These holes ought not to be more than 3 millimetres in diameter, so that the pieces of sulphate cannot pass through. All the pieces composing the small gallery are *brazed* and not soldered with tin.

Figure 4‡ represents the rod of amalgamated zinc, with its appendix, the strip of copper, which passes through it, and the spiral or wire conductor of copper fixed to the appendix by a small screw, (fig. 6.) The copper conductor which I use to form the spiral conductors weighs one gramme and a half the metre; this is, I think the best method of getting the right size.

Figure 5§ is the diaphragm or porous earthen tube.

The diaphragms of plaster or copper only differ from this by the thickness of their walls. It is one millimetre and a-half for those of copper, 4 millimetres for those of the earthen pipe, and $7\frac{1}{2}$ for those of plaster. It is always well to give these diaphragms the same interior diameter, that is to say 6 centimetres.

Figure 7|| represents the whole pile arranged to receive the excitant liquids, or containing them already.

* See p. 10, Vol. 6.

* See page 10. † See p. 10. ‡ See p. 11. § See p. 11. || See p. 11.

Figure 8* is the lead ring upon which the mould is established which serves to make the plaster diaphragms.

Figure 9† is the tin rod, terminated by a small shield intended to close the upper opening of the cylinder. It is upon this that we pour the liquid which fills up the space between the two cylinders.

Figure 10‡ represents all parts of the mould, so placed that there is nothing to be done, but to pour the plaster through the upper opening, *a* is the ring of lead, *b* the small tin cylinder, *c* the rod and shields *d* the larger cylinder, and *e* the spiral thread which keeps the apparatus in place.

Figure 11§ is the wooden frame which is placed over the decomposing cell, in order to make an easy communication between the galvanic battery and the bath into which the plates are immersed.

a is the copper bar to which is suspended the plate *b* which we wish to galvanize.

e is another rod of brass to which is suspended by two hooks the soluble anode *c* metallic silver. It passes through one of the five pair of holes, made horizontally in the wood, and can thus be removed from or brought near to the plate.

f represents the small brass rods, the extremities of which being bent at a right angle, enters into the perpendicular thickness of the frame. These rods lie flat upon the wood itself.

g is the spiral of very fine copper wire, which is to be fastened to the copper pole of the battery.

h is the other conductor communicating by means of the zinc pole with the plate to be galvanized.

d is the slender wire of copper not rolled which serves to establish electrical communication by the immersion of the plate in the bath.

Figure 12|| represents one of the small silver hooks for suspending the anode in the bath.

Figure 13¶ is one of the copper hooks intended for the plate to be galvanized.

Figure 14** is a perpendicular cut of the double basin for iodine or chloro-bromide of lime, when the strips of glass *bb* have been glued upon the borders of the biscuit.

Fig. 15* represents the same basin as the preceding figure with the perpendicular strip of glass *e*, glued all around the double basin, to prevent the evaporation of the substances through the joints of the biscuit *a*.

Figure 16† is a cut of the double basin completed, furnished with the material and ready to be put into a simple or double box whichever I may use.

a is the plate of porous earth; *bb* are the small strips of glass glued upon it; *c* the strips of glass glued perpendicularly upon the edge and small bands of the biscuit; *d* the ribband of wire or gutta percha well glued for joining the lower glass *f* to the surface of the strips *b* and extent of the glass *c*, without being itself glued; *e* is the iodine or chloro-bromide of lime; *g* the ground glass underneath which lies flat upon the biscuit when the box is at rest; finally, *h* is the glass well ground which slides over the upper edge of the basin where the fumes are given off.

Figure 17‡ is a cut representing one of the large sides of the double box which constitutes part of my portable apparatus.

a is the box open on two sides to receive the holder or bearing the plate; *b* the ground glass sliding upon the basin; *c* the vacuum where the fumes are given off; *d* the biscuit lying upon the chloro-bromide of lime *e*; *f* the glass shutting the basin which contains it; *g* the full space which does not touch back to back, because of the intervening ribband of wire or gutta percha *p*; *h* the glass which shuts the basin containing the iodine *i*; *k* the biscuit which covers it; *l* the vacuum where its vapor is disengaged; *m* the ground glass sliding upon this basin; *n* the perpendicular strip of glass glued to the edge of the biscuit, to prevent the escape of the fumes; finally *os* the small glass bands glue upon the biscuit and upon themselves, to form the height of the double basins.

I have omitted, in order to make less confusion, two ground glasses which must lie in the spaces *c* and *b*, represented at letter *g*, figure 16.

Figure 18§ is the small apparatus which permits the polishing holder to be moved horizontally upon its centre, and may be fixed in any position which we desire.

* See p. 102. † See p. 102. ‡ See p. 103
§ See p. 104. || See p. 104. ¶ See p. 104.
** See p. 108.

* See p. 108. † See p. 109. ‡ See p. 110.
§ See p. 113.

a is the polishing holder or plate vice ; *b* a bolt which holds it by four screws ; *c* an iron press, for bringing down the whole upon the edge of a table or marble *d* ; *e* the steel vice the point of which must enter into the neck of the bolt *b* which fits very closely in the opening *f*.

Figure 19* is the small wooden tamper used for polishing plates.

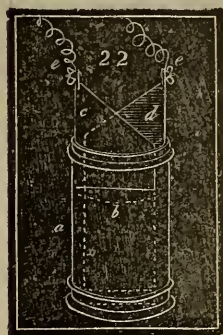
a is a fold of velvet or skin which renders it softer to the hand ; *b* is the piece of caoutchouc glued to the tamper by means of sealing wax ; *c* is a square of white cotton velvet, arranged so that the two opposing ends can be folded back upon the handle of the tamper and held by the fingers of the operator.

Figure 20† is the glass tube serving to diffuse the etherial vapor in the mercury box.

a is the tube ; *b* a little shield of cork ; *c* a small plug of soft wood which closes the tube, and *d* the ether which it is necessary to employ for a large plate.

Figure 21‡ represents the frame with the small inverted cone.

a is the frame in which the groove is pierced at *b* ; *c* is a cut of one side of this frame ; *d* the screw that fixes the groove ;



a the small cone reaching the surface of the plate *f* which lies upon the holder *g*. Finally, figure 22 is one of the small piles of gravel which appears to me preferable to all others ; *a* is the glass box, *b* the wet sand, *c* a plate of zinc, *d* a

plate of copper, and *ee* the screw and wire conductor.

PORTABLE APPARATUS.

I have spoken in these notes of my portable apparatus for whole plates, and as the combination of all the pieces constituting it is the result of numerous experiments with the object of having it occupy the least possible space, perhaps it will be of some advantage to describe it.

The camera obscura is composed of two boxes : one to which the object glasses are screwed : the other which is terminated by

the ground glass and which slides into the former. By means of this slide, the length of the camera may vary from 58 to 62 centimetres.

The camera, reduced to its smallest bulk, is 28 centimetres high when it is placed.

The ferules are so calculated as to adjust the object glass at the interior of the camera, or withdraw it exteriorally from the opening in which it is adapted. We thus obtain all the intermediate focal distances from 17 to 60 centimeters.

I have made a box having the form of a trunk, very firmly put together, covered with impermeable skin and bound with iron upon all of its edges. It was designed to be placed upon the back of a mule in journeying over almost inaccessible mountains.

The inside, well lined with red chamois' skin, is 29 centimeters wide by 41 long and 32 in depth.

At the bottom of the box, is placed three rods with double branches, forming the stand of the apparatus, and which folds in three parts.

All the bolts and nuts are removed. At the side of these three rods, and in a double box of paste board, are put two large polishers the handles of which being separated are placed somewhere else.

Upon the five objects which cover the bottom of this trunk a sheet of paste board is placed 4 millimeters thick and covered on both sides with skin. It serves to make an even surface and prevent jolting. Its angles lie upon small brackets, fixed in the four corners of the box.

It is necessary here for me to take up another order.

A thin wooden box shutting with a slide contains, in small apartments well arranged and furnished with chamois' skin, the following articles :—

The entire head of the tripod, with the exception however of the screw which fixes the movable ball.

Four object glasses with their ferules and eking pieces.

Three diaphragms.

A prism to correct the objects.

Its ferule with endless screws.

Three large bolts and their nuts, serving to mount the top piece upon the stand.

* See p. 134. † See p. 186. ‡ See p. 141.

Six small bolts and their nuts for fixing the six hinges of this last when opened.

The screw or vice of the large movable ball.

A bottle containing mercury.

A small funnel for inserting in the bottle.

A spirit lamp, trimmed and full.

A box of friction matches.

A parcel of packthread.

A knife with several blades and a turnkey.

A box of pins, two drills, some points, of nails and a claw hammer.

Finally the small glass tube with the drops of ether.

This box being shut, is placed in the mercury box which it fills exactly.

The mercury box, shut in its turn, place into the part of the camera in which the ground glass constitutes the bottom. It does not occupy all the inside, but the space which is left void receives two frames with their holder and plate, and a tube of pasteboard containing a candle and forming a stand to hold it. Thus filled, this part of the camera slides entirely into the other and occupies all the inside of it.

The camera, reduced therefore to its smallest volume, is fixed by its screw to the platform, designed to rest horizontally upon the movable head of the tripod.

We place the whole, (the platform underneath, upon the double bottom which covers the disconnected stand and polishers, taking care to keep up the side closed by the ground glass against one of the lateral walls of the trunk. There still remains in this a considerable space to be filled; we put in it:

The double box with double basin, containing iodine and chloro-bromide of lime, and a plate holder placed in the opening of each of its surfaces.

The frame with a holder and plate.

A box containing six plates, which makes nine in number, since there were already three in the frame, and this is more than what is necessary when we wish to take a view.

The plate to be polished and the vice which serves to fix it.

The two handles of the polishers.

The turnkey of the camera obscura.

Three small bottles containing pumice stone, rotten stone and English rouge.

One small bottle of alcohol and another of ether.

Three or four cards of cotton.

A few yards of dark material.

Two towels.

And finally a small hard brush for cleaning the polishers.

The lid of the small trunk bears upon the whole in shutting, and the apparatus, as complete as possible can be conveyed without danger. Not the least empty space exists inside of it.

It requires twenty minutes to take out and put in place *all* that it contains, and the same length of time to take apart the apparatus and put back every thing in its case after we have obtained the proofs which we wish to have.

The enumeration of all these objects will perhaps appear unimportant; but it must be considered that upon the mountain height this, in an Indian hut, and very frequently even in the houses of Paris, we have not always all that is necessary to shelter more than one small corner against the too vivid action of light.

I have often paid very dear for want of a nail, a hook, a little dark material or a piece of cord.

SUPPLEMENT TO THE NOTES WHICH RELATE TO GALVANIC DEPOSIT OF A COATING OF SILVER.

While the preceding notes were delivering to the press, some instruction has been requested in relation to the processes which I have described and the difficulties which we find in obtaining good results, in that which concerns the galvanic deposit of a silver coating upon the silvered plates. I deem it therefore useful to add here some remarks and speak moreover of the method which I resort to and by means of which I operate without ever apprehending the least disappointment. It is so simple and easy that it appears to me almost impossible that you should not succeed at the first attempt, if you will implicitly bind yourself to follow *rigorously* the road which I am about to point out, and which seems to me at present the best and least complicated.

I lay stress on this word *rigorously*, in consequence of my past experience which proves to me that the most essential precautions are often neglected, or arrange-

ments even entirely contrary to the development of the electrical phenomena have been adopted, directly at variance with the instruction given in my notes.

Thus, for instance, four individuals, absolute strangers, to each other, and certainly skillful in photography, have consulted me about their piles, *set up according to my directions*, and with which it is impossible to effect any object. Well! three of these operators have bound together, and by a copper wire, the copper and zinc elements contained in the same box, and the fourth who has not committed the same fault, has made a mistake quite as bad by suspending in the decomposing cell the soluble anode and the plate to be galvanized, to two rods of metal both communicating with the two copper and zinc poles of the battery! It was only necessary to restore the apparatus to its normal state, in order that these piles apparently so discouraging should work like a charm, and the four individuals who will smile perhaps upon reading these lines, if they should fall into their hands, now galvanize with the greatest facility.

The silver bath is prepared as I have already described but it must be diluted with distilled water until the *acid measure* floats at five degrees—weak rather than strong.

Into a small box, or flask with a large mouth, full of water, pour gradually pure sulphuric acid, until the *acid measure* which will rise to the surface of the water stands at 6 degrees.

Take two small glass jars already described figure 22, and let there be a very small hole in the bottom of each of these vessels, in order that the acidulated water absorbed by the sand may run out, just the same as the water with which we sprinkle the flowers which ornament a balcony or window.

The glass is quite easily pierced by means of a triangular glass pile, broken at its upper end and the point of which being sharpened forms a small pyramid very cutting upon its three edges. Plunge this point into the essence of turpentine, apply it upon the glass at the place where you wish to make a hole, and by communicating the same movement to this tool as you would a punch for piercing wood, you soon cut into glass which falls in small

white shavings. Again plunge the point of steel in the turpentine, and in five or six minutes or more you have drilled the glass through and through. To succeed, a little dexterity and some care is necessarily required; it is advisable frequently to be cautious, that we do not go too fast.

Take very fine dry sand, such as the cooks use for cleaning their baking pans, sift it finely and fill with it the two jars which shall have been pierced.

Sink perpendicularly in the dry sand a plate of copper and a plate of zinc, in such a manner that they are parallel and at a distance of 2 or 3 centimetres from each other. For their shape and position in the jar see figure 22.

The zinc should be amalgamated.

Put the two jars thus prepared into a small flat basin in order that the acidulated water which runs out by the small inferior opening may not spread over the apartment, and place this apparatus—this small battery—at the side of the decomposing cell containing the silver bath.

Suspend in this bath and from a copper bar which will lie upon the edges of the cell, the soluble anode held by two silver hooks.

Fasten a copper wire to this same bar and fix the other end of this wire to the copper element of the first jar; there it must stop.

Do not establish any communication, any contact, between this plate of copper wire to this zinc, and make it reach the plate of copper contained in the sand of the second jar, where it will be fixed and go no further.

Do not establish any communication, any contact, between the copper of the second box and the zinc situated near it in the same vessel, but fasten a third wire of copper to this zinc, and fix the other extremity of this wire to a second bar of copper which will lie upon the edges of the cell, parallel to that holding the soluble anode plunged in the bath. It is to this second bar that you afterwards suspend the plates which you wish to galvanize.

The whole apparatus being thus set up, pour upon the sand of each box the water which has been acidulated with sulphuric acid, until the sand being well soaked, the excess of liquid is left to run out by the small opening.

In this state of matters, and immediately after having wetted the sand, the pile is ready for use and may be tried forthwith, in the following manner.

Take a rod of copper of about the size

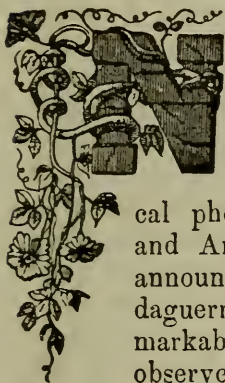
of a crow quill, bring it in contact with the rod destined for suspending in the bath the plate to be galvanized, and, maintaining the whole in contact, plunge into the bath the extremity of this rod.

From the Journal of the Photographic Society.

ON METHODS FOR MEASURING THE VARIATIONS IN THE CHEMICAL ACTION OF THE SOLAR RAYS.

BY ROBERT HUNT.

(Read at the 5th Ordinary Meeting of the Photographic Society, June 2nd, 1853.)



NIEPCE and Daguerre observed at a very early period of their photographic investigations that there were some important variations in the chemical phenomena of the sunbeam, and Arago, in his address when announcing the discovery of the daguerreotype, stated that a remarkable difference had been observed between the photographic power of the solar rays at two hours before noon and two hours after.

It soon became evident to those who were engaged, either in the practice of the daguerreotype, or of the photographic processes on paper, that there were some alterations in the chemical action of the solar rays which were ill-understood. These variations were observed to have no regular relation to the intensity of light—as it often happened when the sun shone with considerable brilliancy, that the photographic result was singularly imperfect. Those who were constantly in the practice of the daguerreotype, especially when employing those more sensitive surfaces which were necessary in the rapid operations of taking portraits, soon discovered a singular inconstancy in the results. It often occurred that the sun shone brilliantly, and that the sky was free from clouds, yet the result obtained was very unsatisfactory. Travelers who had availed themselves of

the discovery of photography, often found to their annoyance, that, as they advanced towards the tropics—and consequently operated in a clearer atmosphere than that of London or Paris, and upon objects more brilliantly illuminated than those in our more temperate climes—the pictures were obtained with difficulty on their sensitive tablet in the camera obscura—and not unfrequently, they had to encounter all the annoyances of absolute failure.

These conditions led several to turn their attention to the construction of some instrument by which these photographic variations should be regularly recorded. The first published account which I can find of any instrument being employed for this purpose, is in a paper entitled "*On a new Mode of registering the Indications of Meteorological Instruments*," by T. B. Jordan, which was published in the Sixth Annual Report of the Royal Cornwall Polytechnic Society in 1838—photographic registers of the indications of the barometer and thermometer having been exhibited at a committee meeting of the society on the 21st of March in that year. In this important paper, after the description of a method of registering the barometer and thermometer, precisely similar to that now adopted at Greenwich, it is stated, "The light and dark parts of the paper show the height of the mercury, and the fluctuations in the intensity of the shade represent corresponding fluctuations in the intensity of the light shining on the instrument, so that in fact it answers the double

purpose, of marking the height of the barometric columns, and *noting the time of every passing cloud*. This fact gave rise to the contrivance of a new instrument, which it is proposed to call the Heliograph; its object is to yield an accurate account of the intensity of the light for every minute of the day, and permanently to register its indications." In the Report for the following year (1839) Mr. Jordan published a paper, "Description of a new arrangement of the heliograph for registering the intensity of solar light," and in this he details a plan by which a numerical value may be given to the indications of the instrument.

In the "Philosophical Transactions" for 1840 will be found Sir John Herschel's paper "On the Chemical Action of the Rays of the Solar Spectrum," in which occurs a section devoted to a "*Description of an ACTINOGRAPH or self-registering Photometer for Meteorological purposes*." "The objects of such an instrument," says Sir John Herschel, "which cannot but be one of material importance to the meteorologist, the botanist and the general physiologist, may be considered as twofold; viz., 1st, to obtain a permanent and, at least, self-comparable register of the momentary amount of general illumination in the visible hemisphere which constitutes daylight; and 2ndly, to obtain a similar registry of the intensity, duration, and interruption of the actual sunshine, or when the sun is not visible, of the illumination of that point in the clouded sky behind which the sun is situated."

These two instruments, the heliograph and the actinograph, were in many respects very similar to each other. Cylinders, with a vertical slit, were made to move at a uniform rate by clock-work over an interior cylinder, upon which was placed the photographic paper, the opening being constantly opposite to the sun. For the details of the arrangements I must refer to the original papers and drawings. Amongst various methods which have been proposed for measuring the variations of chemical action in the sunbeam, the following curious and instructive experiment should be named:—

If the bichloride of platinum in solution is very carefully neutralized by lime-water, and then having been filtered in the dark,

some more lime-water is added, and the fluid is exposed to sunshine, there is a copious formation of a white precipitate, which subsides quickly and is equally collected. The amount of the precipitate, in a given time, is an exact representative of the chemical radiations to which it has been subjected, consequently the actinic power may be determined by the weight of the precipitate, and expressed in grains, or the decimal parts of a grain. Dr. Draper suggested the construction of an instrument, to which he gave the name of a "*Tithonometer*." This instrument consisted essentially of a mixture of chlorine and hydrogen, which is evolved from, and confined over, hydrochloric acid in a graduated bent-glass tube. The gases were liberated from the liquid acid by the agency of galvanic electricity. Platinum wires, which could be connected with a voltaic battery, were inserted in the tube in such a manner, that when the required quantity of the gases was formed the decomposition ceased, owing to the fluid having fallen below the wire. That portion of the tube which was filled with the mixed hydrogen and chlorine, being covered with a metal case and retained in darkness, the gases would not combine, but on removing the cover and exposing the instrument to daylight, the combination of the gases and the re-formation of hydrochloric acid was brought about, at a rate exactly determinable by the amount of actinic power in action during the time of exposure. Consequently the number of degrees through which the hydrochloric acid rose in a given time, became the measurer of actinic power. The action of the iodine of æthyle upon tin or mercury has been proposed as a means of measuring the chemical rays of the sunbeam, and the rate at which a paper covered with chloride of silver would darken in an atmosphere of chlorine, has been also employed by Dr. Percy and Mr. G. Shaw as a ready means of determining the same question with tolerable degree of constancy.

Sir John Herschel, Mr. Jordan and others have committed the mistake, of supposing that the instrument which they suggested would measure the *luminous* intensity of the solar rays. So far from this, it often happens that when the illuminating power is at its maximum, the

chemical power is at its minimum. Thus the heliograph or actinograph, whichever name we may adopt, is merely a measurer of the active chemical rays, and the instrument, if used in connection with a photometer and thermometer, will show many remarkable examples of those three principles being often set against each other.

Some years since I constructed an actinograph upon the principle of that proposed by Sir John Herschel, introducing some of Mr. Jordan's modifications, which instrument I employed for a considerable period. On my removal from the country to London, I was induced to place this instrument in the Observatory of the British Association at Kew, with the hope of securing a series of good results in connection with the meteorological observations carried on in that establishment. But the observers there were not sufficiently interested in the phenomena; the clock-work of my actinograph was used to drive the machinery of some self-registering thermometers, and the cylinder lies there unemployed.

The importance of securing a good set of observations has lately been most forcibly pressed upon me, and I have therefore been led to construct a new instrument; the principles in which are the same as those already described, but I believe many of the arrangements are improved.

This actinograph consists of two brass cylinders moving freely upon their axes, one of them containing a powerful clock-spring, by which the apparatus is driven. These cylinders are fixed about twelve inches apart, and around them is placed a band of indian rubber cloth which being carried round by the friction against the upper working barrel, makes a complete revolution in twenty-four hours. The uniform rate of motion is secured by an ordinary clock escapement and pendulum. This apparatus is adjusted at such an angle that the direct radiations from a zone of the heavens, about 45° above the visible horizon, may fall upon its upper surface. This clockwork is therefore enclosed in a box, and covered with a brass plate, in which there is a triangular opening. The widest part of this opening measures one inch, and the smallest the sixtieth part of an inch. This is divided, 1st, into five holes of such sizes relatively as represent the periods of 1, 2, 3, 4, and 5 minutes;

and, 2ndly, by bars, the openings between each adjusted to regularly increasing divisions, from 10 to 60. From this it will be understood that any point of the moving band will be exposed to the daylight for an hour in passing under the largest opening, and the time of exposure diminished by ten minutes in each of the other divisions until the smaller ones. In these the times of exposure are; under the largest hole five minutes, and under the smallest one minute.

If we attach to the moving web a piece of prepared photographic paper, it will be evident that for the whole of daylight, it will be receiving impressions during the times of exposure above described. The line which passes under the smallest hole will never be exposed for more than a minute, while that which moves under the largest opening will never be exposed for less than an hour; consequently we have the difference between 1 and 60. Now the maximum effect will be the blackening of the paper thoroughly in one minute, when of course the image of the opening and its divisions will be deeply impressed: the minimum effect will be, that the exposure of an hour is necessary to produce any sensible change in the color of the paper; then we shall have the line under the longest opening alone well defined, the others becoming less and less distinct, until the paper remains absolutely white over those parts which correspond with the diminished openings. It is my intention to fix a numerical value to each of these, which will enable me to tabulate my results, and register the relative value of the actinic radiations by the side of the indications of the barometer, thermometer, and hygrometer. I wish to these the photometer could be added, but at present we possess no self-registering instrument which will give us indications of the variations in solar light.

I believe, from experiments which have been carried over a period of many years, that growing plants decompose carbonic acid by a function of their vitality excited by the luminous power of the sun, that is, by light, as distinguished from heat and actinism, and that the rate of this decomposition becomes a most delicate measurer of the quantity of illumination to which the plant is exposed. It appears to me, that it

would not be difficult to arrange some plant—an aquatic plant would in all probability be the best suited for the experiment—which should be supplied with a liquid or gaseous medium, containing a constant quantity of carbonic acid. Now, if the gases liberated by the plant were collected in a graduated tube, the desired end would be obtained of securing a constant registration of luminous action.

The importance of such registration as that which I propose, may not be immediately evident to the photographer; but when he learns to consider the relations of light and actinism as standing in antagonism to each other, and sees the value of determining the law which regulates the variations in the intensity of these forces, he will fully appreciate the importance of arriving at correct conclusions on this point.

The scientific value of such researches will be evident to all. The variations in the conditions of the seasons, as indicated by the phenomena of vegetation, are referable to changes in the relative proportions of the three principles of the sunbeam. It was my good fortune to discover that the chemical principle of the solar rays greatly accelerated processes of germination. It is satisfactory to know that the practical value of this discovery has proved to be great, and the Messrs. Lawsons, of Edinburgh, state, as the result of their experience, that under the influence of actinism separated from light, seeds germinate in a few days, which under ordinary conditions, require many weeks. We know, beyond this, that light is the principle to which is due, indirectly, the formation of wood, and that to the combined influences of heat and actinism are due the processes of floriation and seed-formation. When, from causes which are beyond our reach, an irregularity occurs in the relative disposition of these principles in the sunbeam, we have remarkable abnormal conditions in the vegetable world, and it is highly probable that many forms of vegetable and animal disease will be found eventually to be due to alterations in the relative proportions of these agents.

In the use of my instrument I prefer presenting it to the light of the northern sky, rather than to the direct rays of the sun. In the latter case every passing cloud

which obscured the face of the sun would be registered, but I believe the most accurate registration of the quantity of the chemical radiations active during the daylight, will be more correctly determined by obtaining constant comparative results from the same point of the northern sky. The material with which I prepare my paper is a standard solution of the oxide of silver in ammonia. One wash only is applied to the paper, which is then found to be sufficiently sensitive for all the purposes of the instrument.

I hope the actinograph which I have brought before the society—being simple in its construction and easy of management—may induce some gentlemen present to possess themselves of similar ones, that we may obtain careful registrations in different parts of the country of all the variations in the chemical power of the sun's rays. I am satisfied, if we can establish any mode of actinic registration which shall give us comparable results, that both as an art we shall be enabled to advance photography, and as a science use it to advance our knowledge of the operations of those secret forces upon which depend many of the phenomena of organization and life.

DR. PERCY —I am sure the society will be very much indebted to Mr. Hunt for bringing forward this specimen of ingenuity; but it appears to me that one point requires to be settled about the paper. It should be proved that the surface has at all times a uniform degree of sensitiveness; for instance, if it were prepared at six o'clock in the morning, it has given a amount of sensitiveness, and in an hour, or three or four hours, it may, and no doubt will, vary to a very considerable extent. I should therefore ask Mr. Hunt if he has made definite observations upon that. Then, in regard to another means of determining the photographic intensity of light:—some years ago my friend Mr. Gray and myself were busy about matters of that kind, and we proposed a photographic indicator, which, I think, is a very simple thing. In a small glass tube is placed a little chloride of silver; chlorine gas is then introduced and the tube closed. When the instrument is exposed to the light, a certain degree of darkening takes place within a given time. When the little instrument is removed, and placed in the dark again,

the chloride of silver assumes its original whiteness, and becomes again an equally good indicator of photographic power. You may use it again, and you estimate the degree of intensity by the time required in the respective cases. I think these things might be made very cheap, and be put into a little case not more than 2 inches long, so that photographers might use them in general practice.

MR. HUNT.—With regard to the impression of paper, it is a point to which I have very extensively turned my attention. Some years since, I constructed an instrument similar to, and rather a modification of, Sir John Herschel's for the British Association, and had it worked for several years. On coming to the metropolis, I wished it to be placed in the Observatory of the British Association at Kew; but there it was thoroughly neglected; I could never obtain any returns. The paper I adopt is prepared with a solution of the oxide of silver in ammonia. A solution of

that kind, kept in my bottle, remains constant for any length of time. After one single wash of this, the paper is placed damp in the instrument, and exposed during the hours of night; it dries, and in the morning it is in a uniform condition, which will last during the day.

There is one point upon which I have long since come to a decision, viz., that it would be unwise to expose an actinometer to the direct action of the solar rays. I fix this in a box, to secure it as much as possible from the solar heat, and instead of placing it opposite the sun, I expose it constantly to the northern sky, by which I get, I believe, a more uniform measure of the pure atmospheric effect of the solar rays than I should do by the direct action of radiation. I should be pleased if Dr. Percy can suggest any plan that will be feasible for obtaining the quantity of light, because now we have no single instrument by which we can measure throughout the day the variations of the solar light.

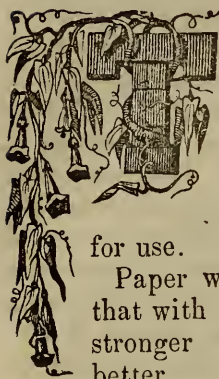
COPYING.—A term applied to taking facsimiles of original daguerreotypes, either reduced or enlarged. The manipulation is the same as for the original, with the exception of a slight difference in the focus of the camera box which is purposely constructed with an inner sliding box. Mr. G. N. Barnard, on this subject says:—The chief difficulties in making copies is that the copy is produced in a much lower tone—that is, the lights and shades are much weaker, and the lines are not so sharp and distinct as in the original. (The greatest defect, we think, is the non-production of the middle shades.—*Ed.*) The freshness and brilliancy of a fine tone daguerreotype I fear can never be imparted to the copy, but we can produce one as clear, distinct, and strong as the original; more than this should

not be expected. In my process I use a 1-4 camera, with an aperture in the diaphragm about the size of a dime, and I place the picture to be copied directly in the sunshine, by which all reflection will certainly be avoided—because the direct light is stronger than the reflected light. Reducing the size of the aperture in the diaphragm produces the sharpness and distinctness of the original, and in aid to this, and to obtain the same strength of light and shade, I use a smaller quantity of bromine in the preparation of the plates. Daguerreotypes may be copied from four to eight times the size of the original, by using 4-4 or 8-4 cameras, with diaphragms of small aperture, and elongating and enlarging the box to the desired size. They may be taken even as large as life.

From the Journal of the Photographic Society.

DIRECTIONS FOR OBTAINING POSITIVE PHOTOGRAPHS UPON ALBUMENIZED PAPER.

BY H. POLLOCK, ESQ.



THE paper should be carefully chosen, by holding up every sheet to the light, and only those sheets which are homogeneous in appearance and free from the spots should be kept for use.

Paper well sized is preferable to that with little size, as it is much stronger and takes the albumen better.

The albumen should be obtained from new laid hens' eggs; twenty-four is a convenient number to use at a time; these will yield 24 oz. of distilled water (making 30 oz. in all) and 4 per cent. of chloride of ammonium, viz., 1 1-4 oz.

The albumen, water and chloride, should be whipped with a silver fork for several minutes, and then strained through a fine cambric handkerchief, rejecting all that does not pass through by its own weight, into a narrow, tall jar, and allowed to stand for not less than forty-eight hours (in cool weather it will keep well for eight days.) at the end of which time three-fourths of the albumen is to be poured off into a shallow vessel, rather larger than the sheets of paper intended to be albumenized.

To put the albumen on the paper.—Take a sheet by two opposite corners, turn one up, place the sheet boldly on the albumen, the centre first coming in contact with the albumen, lower the corners of the paper gradually, carefully excluding the air; let the sheet so placed remain four minutes, then take it by the turned up corner and rip it from the albumen quickly so as to carry up a quantity of the albumen with it; let it drain for a minute or two, moving it so as not to allow the albumen to run in streaks; pin it to a piece of tape by two corners, and when dry pass a very hot iron over the back; this ends the albuminizing process.

To make the paper sensitive.—Place it,

albumenized side downwards, for four minutes, on the surface of a solution of nitrate of silver of the strength of 90 grains to the ounce of distilled water; pin it up by one corner to dry, and keep it when dry between pieces of blotting-paper. This must be done by yellow light or the light of a candle.

To print from the negative.—The simplest apparatus to have is a number of pieces of plate glass 1-4 of an inch thick, colorless, about 12x10 inches in size.

The sensitive paper is to be placed on one of the plates of glass, sensitive side upwards, and the negative is to be placed firmly upon it, collodion side downwards, and a second glass plate is then to be placed on the negative, and the whole arrangement exposed to the light. The time for exposure is from three minutes to an hour: with a little practice the negative can be lifted up and the positive viewed from time to time without any risk of displacement.

The best rule is to print the lightest shade on the positive very decidedly darker than it would be wished that it should remain permanently.

To fix the positive.—On removing it from the pressure frame, place it in a bath made as follows:—

Water	6 oz.
Hyposulphite of soda.....	1 oz.
Nitrate of silver solution 50	
grs. to 1 oz.....	15 minims.
Iodine of silver, dissolved in	
a saturated solution of hy-	
posulphite.....	10 minims.
Chloride of gold.....	3 grains.
Chloride of silver (blackened	
by light)	5 grains.
Acetic acid	2 drops.

Mix these, let them stand some hours, filter before use. If the chloride of silver is omitted, the bath will do very well, but will very much improve with age, as it will acquire chloride of silver from the positives placed in it.

The time to leave the positive in the fixing bath varies from one hour to twelve ; to get good black and white tints, the average time is five or six hours ; when the desired tint is obtained, remove it into a bath composed of

Water..... 6 oz.

Hyposulphite..... 1 oz.

leave in this for half an hour, and then keep it in running water for several hours. If the water is hot, the time of soaking may be lessened ; boiling water is objectionable. Nearly dry the positive between sheets of clean blotting-paper, and finish it by passing a very hot iron over it.

General Remarks.—The albumenized paper will keep any length of time in a dry place.

When made sensitive as directed, it will keep three days, always supposing that it is both prepared and kept most carefully excluded from white light. If instead of a solution of nitrate of silver of 90 grains to the ounce, a weaker one be used to make the paper sensitive, it will keep when sensitive a much longer time,—with a 30-grain solution, a fortnight or sometimes even a month ; but then it does not give a positive of the same force and tone as that obtained with the stronger solution.

After the fixing bath has done its day's work it should be poured back into the bottle from which it came, and the bottle be filled up from the finishing bath ; and so the bath is kept always of the same quantity, and by adding from time to time chloride of gold, it is kept of the same quality.

The nitrate of silver and chloride of silver will never have to be renewed ; the iodide of silver should be added as at first, viz., 10 drops for about every 200 positives fixed ; and the acetic acid, viz. 2 drops for about every 400.

In a bath of 24 oz., as many as 30 positives 5 inches x 4 may be placed at one time ; but the dark tints will then appear very slowly and gradually.

To ensure a good positive (next to having a good negative,) it is most important to print of the right depth ; neither too much nor too little ; great attention should be paid to this, for the finest tints are only to be obtained in positives exposed exactly the right time.

Positives printed in a bright sun quickly, are always better than those obtained by longer exposure without sun.

21 Maddox Street, Regent Street.

ON DEVELOPING AND CLEANING COLLODION IMPRESSIONS.

46 Camden Street, July 13, 1853.

DEAR SIR—In my attempts to procure photographic pictures in this weather, I find that the results are equally uncertain ; the time which will give a good picture is only sufficient at another part of the same hour to procure faint traces ; then, again, pictures procured at one time by a certain length of exposure, are overdone at another part of the same day by the same exposure.

I cannot therefore quite determine whether the overdone appearance is caused by too long an exposure, or by too long a time in developing with the protosulphate of iron solution. Be it, however, which it may, the deposit of silver is too thick, obliterated

the delicate drawing : can you oblige me by informing me whether any agent *stronger* than the hyposulphite of soda bath can be used to dissolve off the silver, or whether the hyposulphite can be made to act with vigor in dissolving off the iodide of silver.

Sometimes a cloudy path or an obstinate spot will remain ; they will in most cases give way to slight friction, but that disturbs the collodion, and interferes with the equality of tint. Can you tell me of any agent which dropped upon such parts would dissolve off such blemishes, and could be washed away the instant it had done so ?

But for these mishaps, I have taken some very good pictures. I remain, dear Sir. Your obedient Servant.

B.

A GENERAL REVIEW OF THE DAGUERRETYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumière by W. Grigg, A. B.

SECTION XV.

OF THE COLLODION.



THE preparation of the glasses with a solution of collodion, in place of the albumen, is of a nature to give to photography an extraordinary impulse, on account of its excessive sensibility which is equal to and often surpasses that of the silver tablet.

This is an application as excellent as singular of gun cotton. It owes its origin to two pupils of M. Pelouse who discovered the solubility of gun cotton in sulphuric ether with the addition of alcohol. Profiting by this property, I had the advantage of first preparing these vitreous pellicles, which have since taken the name of collodion, in consequence of their agglutinative virtue and of their employment in surgery for preserving wounds from contact with the air. It is also the receipt which I first followed by the advice of M. Milan, one of our most skillful chemists, which has prevailed for the preparation of collodion.

At the time I gave this reason for it: there are many kinds of gun cotton; the most energetic of which is the true pyroxiline, insoluble in ether, while the powder cotton prepared with saltpetre which *fuses* at the time of its combustion is extremely soluble in ether, and to establish this distinction, I named it etherziline.

Photographers will certainly have more advantage in buying collodion ready prepared with the exception of a modification according to their liking; it is well however, to explain its preparation in case of need.

Gun cotton which forms the base of collodion is a combination of ligneous with acetic acid. Its elements, azote, carbon, hydrogen and oxygen are in such propor-

tions that application of fire allows this solid body to transform itself at once into gases, among which azotic, and carbonic acids and steam predominate.

The powder cotton was at first prepared with acetic acid containing a single equivalent of water, it was afterwards found more sure to add sulphuric acid.

Acetic acid more-hydrated gives a fusing cotton like that obtained with a mixture of salt-petre and sulphuric acid; this gun cotton was worth nothing, by reason of the residuum which it left, and which soiled the guns. The pyroxiline properly so called, however does not appear to have entered into practice, while collodion will receive more and more numerous applications, and its employment will be considered an epoch.

To prepare collodion, mix 600* grammes of concentrated commercial sulphuric acid with 400† grammes of saltpetre reduced to powder. In this calculation there are found two equivalents of sulphuric acid to one equivalent of mono-hydrated acetic acid which form a mixture of a silvery appearance holding in suspension crystals of sulphate of potash produced by the reaction.

There is no precaution to be taken in forming this mixture; but it is necessary to wait, in immersing the cotton, until the heat produced be dissipated; neither is there any weighing necessary for the cotton; as much should be put in as the liquid can saturate, kneading it with a glass rod. It is probable that the cotton immersed first produces pyroxiline; it is certain at least, that the combination of the mono-hydrated acid abandons its water by composition which is left in excess for the cotton coming after; for I assured myself by direct experiment that the combination takes place instantly. Having rapidly saturated some cotton and withdrawn it immediately to place it in water, making use this time of a mixture of Nordhausen sulphuric acid and mono-hydrated acetic acid, this cot-

* Continued from page 156, vol. 6, No. 3.

* 10800 grains. 1 lb., 10 oz., 10 dwt.

† 7200 grains. 1 lb., 3 oz.

ton became so combustible as to shatter the gun.

The foot glasses are very convenient for immersing the cotton, as they may be held from the side, to avoid the evil consequences that might arise from the spirting of the liquid on the face, by an effervescence which often takes place when too much cotton is immersed at once: one is warned of this occurrence by a disengagement of rutilant vapors; sometimes it is unattended, but one should be suspicious of it and incline the glass to one side. If the effervescence goes on steadily increasing with a formation of black glutinous matter, the operation is a failure, and it is necessary to abandon the vase or plunge it into water.

As soon as the cotton has been well saturated by kneading, it may be withdrawn immediately to plunge it into a large vase filled with water in which the cotton is spread, and the water of which is often changed; after which the cotton is pressed with the hand under a jet of water.

However well washed the cotton may be, it is always acid: it is rendered neuter by having it boiled in water, clear, or with the addition of ammonia. After this, it only remains to dry it after having strongly pressed it between sheets of bibulous paper and spread in small tufts in the open air.

Photographic collodion is composed of gun cotton dissolved by alcoholized ether, containing ioduret of potassium, nay, it is even said, ioduret of silver.

To prepare it, your cotton is put in *rectified* ether to dissolve, containing at the most a tenth of alcohol as much concentrated as possible, working the mixture from time to time. At the end of twenty-four hours, and even sooner if there is need of haste, it is filtered through linen of very fine mesh.

It is perfectly useless to proportion the cotton, the ether will take as much of it as possible; and, if the mixture is too thick to be well filtered, which rarely occurs, ether must be added before filtering.

The consistence of the collodion can only be well judged of by trying it on a glass.

From an analysis of M. Leon Krafft which I find in the last number, of La Lu-

miere, the English collodion, which has been found the best, till now, contains about 126 grains of ioduret of potassium to a pint; it will be well to put in the same quantity after having dissolved it in spirits of wine; after which nine times its volume of alcoholized ether holding the collodion is to be added to this ioduretted spirits of wine.

The quality which is especially required in the collodion, is its sensibility, to produce the portrait, it is at the same time necessary, that the coating be solid, not cracked, homogenous and very transparent. It is generally believed that the sensibility depends principally on the proportion of each ingredient, ether, alcohol, gun cotton, ioduret of potassium, and even ioduret of silver; there is but one thing which is little heeded and which seems to me the principle, viz., the *nature of the gun cotton*. This is, in my opinion, the essential thing.

The coating of collodion is put ordinarily on plate glasses; but this is a useless expense and luxury; window glass of fine quality, free from defects, and very smooth is excellent; after having had some cut of the size of the case, the edges are smoothed, to avoid cutting ourself in cleaning.

It is important, before pouring on the collodion, that the glass plate be perfectly clean and free particularly from all salts capable of exerting a local reaction. It is sufficient to rub it with a pellet of skin and white polishing powder, tripoli, powder of saphire, and especially *potée d'étain*, which is habitually employed for cleaning the plates. It is necessary to blow from time to time to condense the breath upon and to judge of the state of the glass. Greasy bodies are not so much to be dreaded as is said; it is only necessary that the state of the glass be every where the same. I have rubbed some with the common essence of turpentine, so as to leave its resin without remarking anything. Soap diminishes the adherence of the collodion; the plate coated with the collodion, still damp from the condensed breath, acts very well; in a word, it is sufficient that the sheet of glass be perfectly clean, which is easily attained. The spots which form on the proofs are almost always superficial and produced by the nitrate of silver remaining in excess during exposition in the camera.

The plate of glass is ordinarily held by a rod of gutta percha which is fastened to it by softening its end with the lamp.

The formation of the coating of collodion is a very delicate operation, which requires skill and a certain dexterity. All those whom I have seen operate take great care to work out of the light, with the aid of a paper; this is a great mistake: ours is incommoded, only by the vapor of the ether, which may set fire to something. This operation should be done *in the open light in order to see well* the operations.

To succeed in it, a quantity of collodion double that required to cover it must be poured gently upon the centre of the plate, and immediately, giving to the plate a whirling motion, holding it obliquely in every direction the collodion spreads itself round; when it is near the edges nearest to the centre, the plate is held obliquely, on the long side until it covers the whole plate on the side lowered, and immediately the other end is rapidly brought down and the excess of collodion is poured off from one angle. At this moment the plate is covered with longitudinal stripes; the moment is watched when the collodion commences to lose its fluidity, and immediately, by a sudden movement the plate is inclined the long way. This movement should be very rapid not more than two seconds duration; then, without delay, the plate is placed on a level surface.

A quarter of a minute after, at the most, the plate may be placed in the bath of nitrate of silver. A plate thus prepared and carried to perfect dryness exfoliates when placed in the nitrate bath.

The bath of nitrate should be composed as I have already described for papers; that is to say, should contain at the least 15 to 100 of nitrate of silver; a *trace* of acetic acid is added to it. It should previously be saturated with an excess of this substance freshly precipitated.

The plate is put in the bath by the light of a taper at some distance off. The dishes, such as I described for albumenized plates are decidedly more convenient than the pans. I have been desirous of constructing pans by joining plates of window glass with ribbons of gutta percha. These dishes at first held the water very well, but on the least shock the plates became loosened.

The dishes are very convenient for examining the plate by their transparency; it is raised from time to time, to examine its surface; when it has reached a yellowish black every where equal, which takes place in a minute at the most, it is removed to allow it to drain, its surface is then traversed by liquid veins which bear a strong resemblance to the net work appearance of the representations of a railroad on an atlas.

I was for a long time without knowledge of the cause of these lines on the proofs, but once however, wishing to take a beautiful effect of a setting sun with clouds, I did not take time to drain my plate, and when the plate was put in the gallic acid, I beheld all my clouds crossed by white branches, the origin of which I could not misunderstand; where, therefore, the nitrate is in a thick and moveable coating, the proof will be lost. The plate may be lowered until on being raised it appears covered with a continuous coating of liquid. I cannot, at present, decide which is the best process; I prefer not waiting till the plate becomes perfectly wet, which I leave to drain five minutes. The sensibility is certainly diminished, but how disembarass ourselves of these lines or net of moving liquid?

Thin coatings are, it is said, more sensitive; coatings, however, of the greatest thickness give pictures of more intensity, by reason of the greater number of reduced particles in the space. This is why an excess on either side is not good; very thick coatings give, scarcely any image, while very thin ones give very light pictures.

The sensitiveness of the collodion is extremely variable, according to the temperature and especially the hygrometrical state of the atmosphere; its elements react one against the other in the liquid state to such a point that the collodion precipitated becomes changed into a ligneous, or at least into a body very difficult, to burn in relation to the gun cotton.

This sensitiveness, the causes of which are yet unknown, appears to me to be limitless in proportion to the ingredients entering into its composition, or which may be associated with it by means of the bath of acetate of silver, in which it is immersed

before exposure in the camera. At the present time this sensitiveness is very great; with the collodion one can operate five to ten times as quick as with the silver plate, for positive proofs; it is equal and even double for negative proofs fit for the reproduction of the positive images on paper.

This demands an explanation: before becoming negative, these proofs are always positive, at one degree more or less marked, which depends on the salt used in fixing.

The cyanuret of potassium in a concentrated solution acts in this way with great energy; but it considerably softens the collodion, and, which is worse still, causes the disappearance of the proof in a very few moments so perfectly that I have been able to use a second time a coating of collodion by immediately removing the proof by two washes, one with water and the other with alcohol charged with iodine to iodize the plate anew.

The hyposulphite of soda, especially when it has already been used, pays more attention to the blacks of the negative proof, or, which is the same thing, the whites of the positive proof; but it does not give such beautiful whites to the positive proofs. The obtaining of positive proofs on glass plates covered with collodion is of the highest importance. In fact, these proofs framed by placing, after having varnished them, in at the back a piece of rough black paper, and leaving the back outwards, have as much and often more effect than proofs on silver; with the exception of the fragility of the glass they present many advantages which are of being in the natural position, of not reflecting more in length than in width, of leaving no access to the dust and the action of the air, and of being susceptible of identical reproduction by means of certain conditions which I can but glance at as yet.

From this time forward it is certain that positive proofs will be obtained in the *fortieth of a second*, since at the present day, I have continually worked with my apparatus at least five times quicker than with the accelerating substances which have allowed me to take views illuminated with the full sun in the eighth of a second. The chief difficulty will be to regulate the duration of the insolation, which can only be limited by a mechanical movement.

Portraits are consequently obtained,

identical, at first sight, with those of the daguerreotype, in one or two seconds in the interior of an apartment moderately illuminated, before a window receiving light from the sky alone, and, about $6\frac{1}{2}$ feet from it; in ordinary galleries, in full light, but in shade, the fraction of a second would suffice. With certain combined glass apparatus for normal plates, for the half size, which are very useful at the present day, one should not go beyond a second under the same circumstances.

The principal condition to be observed to obtain well defined positions, are:—

1st.—The employment of glasses of an irreproachable purity of surface by cleaning.

2nd.—Not to expose the plate on withdrawal from the bath to the least light containing photogenic rays; a simple taper left about 2 inches before a prepared plate gives positive proofs from a negative in fifteen seconds, consequently, this feeble light would surely veil the blacks of the positives, if the precaution were not taken to shade the taper with an orange yellow glass:

3rd.—The collodion employed should give a perfectly transparent coating, in the dry state, after fixing.

By observing these conditions, proofs are obtained which are certainly finer than those on the silver plate; no exaggeration can end the illusion, so perfect is the continuity; positives obtained from negatives can give no idea of this indescribable perfection. As they are first corroded by the fixing liquids, diminished afterwards by reproduction, in proportion to the roughness of the surface which is ordinarily of the paper. I have thought, doubtless like many others, of remedying these imperfections, and I have succeeded in producing heavy surfaces on glass of indefinable beauty. I intend saying a few words thereon presently.

Notwithstanding the varying sensitiveness of the collodion, of one flask, to another, not much greater embarrassment is experienced in fixing the duration in the camera, with negatives, than for the daguerreotype itself; this will be much more difficult for positives which exact that the required time be observed in order that the perfection of the *tout ensemble* may accord with the marvellous delicacy of the details.

It will be necessary to observe the least possible delay in placing the plate in the camera; the slightest detentions are often the cause, when great sensitiveness is reached, of a total absence of image, which is manifested by a general tint, grey by reflection, and brown by refraction; there are moments when this happens without one being able to assign a reason.

As soon as the plate is withdrawn from the camera, there must be equal haste in bringing out the proof.

I have studied comparatively the substances employed for producing a rapid appearance of the picture. For positive proofs the proto-salts of iron seem to me superior to all, independantly of the convenience of their employment and their moderate value. I shall speak of them in detail in my next article.

HEAVY COLLODION.

I made one day, involuntarily, some heavy collodion by very simply incorporating with ordinary collodion iodide of potassium in a slightly concentrated solution, and in sufficient quantity to give the desired sensitiveness, which would result by adding a little water to the ordinary ioduretted collodion; I have since in fact succeeded with this. This collodion put on a plate of glass covers it with a heavy coating as white and as opaque as the paper; but the fineness of the grain of the collodion is so great that I could not become weary in admiring it. M. Emile Rousseau has discovered another process which gives him collodions of very varied consistence. These collodions will certainly be used by engravers for making their grain, because they are infinitely more fine than those of the varnishes. M. Quinet possesses also a particular receipt which, for fine heavy coatings, gives results of surprising beauty.

These collodions are ordinarily slower in finishing proofs. This is no defect, for they can give no negative proof fit for use, by transparency the white portions are almost as opaque as the blacks.

It will, doubtless, be necessary to treat them as the paper, for the sun can not be used, and in a diffused light at the extremity of an apartment, but three seconds is necessary, from experiments I have made.

Heavy collodion presents no advantage,

except it be laid on a polished surface; it does not change the aspect of the paper and the ground glasses; in a word, it does not seem as though it should be employed except for matters of luxury.

SECTION XVI.

PROTOSULPHATE OF IRON.

For bringing out the proof on removal from the camera pyrogallie acid and the protosulphate of iron are principally employed.

This last agent is the most economical and the most simple of all; but it requires, to produce all its effect, to be used under certain conditions, I have studied it much; the following is my *modus operandi* which has constantly succeeded: 1800 or 3600 grains of common sulphate of iron are put into a glass flask of the capacity of a pint with some Paris nails, nearly fill the flask with ordinary water, containing about a twentieth of commercial sulphuric acid in bulk. As soon as the mixture is made, the sulphate of iron dissolves and the iron is attacked with a disengagement of hydrogen gas, which reduces the peroxydated sulphate of iron. At the expiration of a quarter of an hour liquid is ready for use; but the more the disengagement of the hydrogen gas has been prolonged, the greater is the reducing power of the liquid.

For using this liquid, it will suffice to filter some of it into a foot glass provided with a spout for pouring on the plate placed on a levelling screw support. The reducing action of this liquid is instantaneous; without fear of softening the collodion, it might be left several moments on the proof.

A singular fact, but as soon as the proof has been covered with the solution of acid protosulphate of iron, it has then nothing further to fear from the light; and what is still more astonishing, the access of the light augments, on the contrary, its intensity. I thus obtained the proof of this fact.

Having taken a view, which, after passing it to the sulphate of iron, showed no trace of an image, I wished to turn my plate to account to know at what point it would discolor in strong light, I therefore, approached the window, examining it attentively. To my great astonishment, at the

end of a few minutes, the before invisible image began to show itself.

The effect was, however, too indistinct to draw thence a conclusion: I therefore took measures to prove the direct effect of the sun.

I placed a positive proof, still covered with the sulphate of iron, in its frame, and having covered it half, with its mat, so as to hide the half of a house. I exposed the proof in this state to the direct power of the sun for six seconds; the result confirmed my first observations; *the portion enlightened by the sun had, evidently, whites of greater intensity, and after washing with the hyposulphite, the blacks were just as pure in this region as in that which had been hidden by the mat*; hence I concluded that a proof covered with sulphate of iron might be brought into full light for examination, and even left exposed thereto to increase its effect, if too feeble.

The protosulphate of iron is excellent for the production of positives; I am persuaded that it will be preferable for negatives, if I believe M. Brebisson concerning it, who has not employed it in all its power, that is to say, with a prolonged disengagement of hydrogen gas.

M. Wittnauer gave one specimen of sulphate of iron in a soft microscopic crystal resembling gallic acid but of an almost pure white; this is, I believe the *true protosulphate of iron*. At the end of eight or ten days, its solution, left exposed to the air in a thin layer in a dish, still gives instantaneously the most beautiful blacks. I do not doubt that this salt is produced with the mixture I have spoken of, at the expiration of a few days of action of the acid on the iron. This mixture might still be placed in a deep dish and the plate plunged therein; this is the process that I have followed for the proofs of small dimensions, it presents a host of inconveniences; it is difficult to avoid the pellicles of reduced silver which swim continually on the surface of the liquid, and moreover, the nitrate of silver introduced at each immersion is the cause of the blackening of the iron by covering itself with the precipitated silver, which ends by placing obstacles to the action of the sulphuric acid, and, consequently, to the disengagement of hydrogen gas.

PYRO-GALLIC ACID.

Pyro-gallic acid is generally employed for negatives; its action is still very rapid, although much slower than that of the protosulphate of iron; it is associated for this purpose with the acetate of silver acidulated with acetic acid.

Two solutions are prepared which are mixed together, in equal portions, at the moment of pouring them upon the plate of glass.

- | | |
|------------------------------|------------|
| 1st.—Pyro-gallic acid..... | 18 grains. |
| Concentrated acetic acid | 450 “ |
| Distilled water | 3600 “ |
| 2nd.—Acetate of silver | 36 “ |
| Distilled water | 1800 “ |

A solution of gallic acid still more diluted may be employed; the effect is merely less rapid. When there is cause to fear that the impression may be too strong, the first solution is poured on separately; following the mixture of the two in equal parts.

With the protosulphate of iron the effect is instantaneous, its action cannot be arrested; it is not the same with pyro-gallic acid; its action is graduated, the blackening of the proof may be followed by illuminating from beneath with a taper, and arresting the ulterior effect of the pyro-gallic acid, by rapid removal by water poured on in abundance.

FIXING OF THE PROOFS.

This operation is performed differently, according as it be a positive or negative proof. All the fixing salts have the disadvantage of attacking the blacks, so as to make them entirely disappear in the course of time; these blacks formed by reduced silver or gallate of silver excessively disunited, give the whites of the positive proofs.

The bromide and ioduret of potassium attack the blacks less, but they also dissolve with difficulty the ioduret of silver; they can be employed, consequently, only to prevent the blackening of the negative proofs, which are too feeble to be submitted to energetic fixing agents.

The most energetic fixing compound is the cyanuret of potassium: it is employed in the proportion of one part concentrated solution to four of ordinary water; the proof being washed, it is covered with this mixture, and as soon as the ioduret of

silver has disappeared, hasten to wash the glass in water. The cyanuret softens the collodion and makes the whole image gradually disappear, but it gives fine blacks to the positive proof.

The hyposulphite may also be used as well for positives as negatives; the whites of the positives will not be as lively, but the collodion will preserve its solidity, and the deposit of silver will be less attacked. It is used exclusively for negatives, in the same proportion as the cyanuret of potassium.

It is better to put this dissolvent into a dish and leave the plate in it without removing it, the moving of the liquid being attended with the disadvantage of attacking the outlines of the proof, without touching the centre.

After fixing, which principally consists in dissolving the ioduret of silver, the proof is simply rinsed with plenty of water, to remove the hyposulphite and the soluble salts of silver, then placed to dry slowly in an inclined position, out of the dust. The proof, having been dried in the air, should be submitted with precaution to the heat of the spirit lamp, which will give to the pellicle of collodion great adherence; it is then to be varnished on the proof side with very clear picture varnish with the addition, when used, of essence of turpentine, to give it the necessary fluidity and to be able to apply it with a brush, in as thin a coat, as with collodion.

There is no one who has not acknowledged that collodion is an excessively variable composition; the elements of which it is composed undergo incessant transformations by the influence of time, temperature, and particularly *light*. The iodine, which is perhaps the most unstable of the chemical elements produces iodoform and an ether by the decomposition of the gun-cotton; the sensibility of the collodion becomes greatly changed. It is impossible to protect it from the action of time and temperature, but it is easy to keep it out of the influence of light; it is a precaution which I recommend; I have as yet no certain proof of the change of the collodion by the light, but it cannot be doubted, and the comparative trial with two flasks, the one kept in the dark, and the other exposed to the rays of the sun, will clearly decide the question.

The greatest defect of the collodion is in furnishing a non adherent coating of ioduret, which becomes detached in different places at the moment the glass is removed from the bath of silver; it is the superficial coating of ioduret which then becomes *separated* from the collodion instead of *incorporated* with it; this arises from an excess of alkaline ioduret, from a principle of humidity which proves the collodion has not been prepared with *rectified* ether and alcohol. This is often remedied by adding to this defective collodion a certain quantity of neuter collodion, thick and heavy.

The obligation one is under to use water to dissolve the ioduret of potassium leads directly to this imperfection: I have therefore employed successfully the ioduret of zinc, which dissolves rapidly in collodion in the dry state. With this ioduret, I have obtained, notwithstanding, very variable results. For greater regularity in its employment, I dissolve some in rectified alcohol; a deposit was formed, and the liquid changed, turusol paper perfectly red.

This acid is, I think, very injurious, for I only obtained success with gun cotton I had prepared myself, and my collodion was ammonia alkaline; without waiting until the acid had disappeared with the washes, I passed it to a water strongly charged with ammonia, and I added a few drops of concentrated ammonia to my collodion.

I have, however, made good collodion with gun cotton that I had prepared by covering a capsule containing bruised saltpetre and sulphuric acid, with three or four layers of cotton rags, placing a plate of glass upon the capsule thus covered, and leaving it to act five or six hours. One layer of this rag placed fuming with the acid into alcoholized ether has given me very good collodion. On again making the preparation I have not always succeeded in forming the soluble rag.

I have made a great number of experiments to increase the sensibility of the collodion; a few drops of the essence of cloves, and a touch of gallic acid, have appeared to me to succeed. In order to understand the style of action of the gallic acid, I have put a piece as large as a nut into a flask of 100 grammes (1800 grains). The experiment ended, the image appeared before the passage to the sulphate of iron; but the sulphate of iron did not develope

it further. It seems to result therefrom, that the continuing agents introduced into the collodion produces this effect in the camera by pure anticipation.

During my researches on the preparation of continuing positive papers, prepared by means of a simple imbibition with nitrate of silver. I made an experiment which procured me a new paper of this kind, and demonstrated to me at the same time that the paper largely covered with a solution of nitrate of silver is no more sensitive than that which is moistened with it the least possible; and, by analogy, the coating of nitrate of silver on the collodion can never be too thin if the divisions of the liquid which form furrows in the collodion while yet oily its sensibility should be at the maximum ten or fifteen seconds after its immersion in the bath of nitrate of silver.

The following is my experiment: I exposed at once to the iodine five or six sheets of starch sized paper; at the expiration of a very short time, all the sheets took an uniform violet tint. I took one of these sheets and after having divided it into two parts, by cutting it with a knife as far as the edges, without completely separating the halves, I placed the paper smoothly upon the surface of the acidulated nitrate of silver; gradually the paper became impregnated, forming a paper ioduretted with the nitrate of silver, absolutely like the old processes.

The same effect is produced on the reverse side, and is manifested by a yellowish white dotting, showing on the blue base; it is followed by a marbling, which is lastly transformed into a perfectly uniform yellowish white, as beneath, but without the least appearance of liquid after the most attentive examination. Having then removed the sheet of paper that I separated into two, to place one of the sides reversed, laying them according to the cut edges, one half became perfectly steeped with the nitrate of silver at the side of the other half, which was the back, appearing thoroughly dry. I then placed upon these two fragments of paper a stereotype, representing a portrait, so as to make the proper line of separation comprehend each half, afterwards exposing the whole a few seconds to the surrounding light, and passing it to the gallic acid, it happened that

the image was as decided on one side as on the other, in a word as complete as though it had been a single sheet of paper. It results from this experiment that a paper thus prepared may be worked by employing the reverse side, which will be found free from all impurities, and almost always sufficiently dry to be able to apply the stereotypes at the expiration of an hour, after having pasted the paper on glass on the side which touched the bath. This paper is very sensitive. As soon as I had thought of the experiment, I held it a duty to execute it, and although it was night, I succeeded in obtaining a proof on the back of the paper, by placing the picture at 2 1-3 inches from a taper.

In a preceding article I gave the opinion that the coating of acetate of silver bathing the collodion, might detract from the clearness of the pictures produced; sometimes, in fact, by a general action, the proof becomes replaced by a uniform greyish coating, which is the sign of great disagreement between the collodion the bath of silver and the continuing liquid; but there are sometimes too grey vertical stripes starting often from the angles of the plate. I for a long time believed that contact of the fingers was the cause of it; these effects are much more frequent on small than on large plates, when they often pass off unperceived. I at last discovered the true cause of it, these stripes are produced by the *contact of the edges of the frame which unites a substance in decomposition with the normal acetate of silver*. It will therefore be necessary to keep the frame very clean, especially when working with small plates.

When the collodion is sensitive, it takes on contact with the acetate of silver a translucent greenish yellow color, which indicates that the ioduret of silver is, so to speak, in the primary state, and in particles excessively separated. For its preparation it is well to apply the mixture of salt-petre and sulphuric acid only after a *cessation of the disengagement of nitrous acid*; this gas is extremely hurtful to gun cotton. The passing to the ammoniacal water is also an excellent thing. When I employed acid gun-cotton, I made use of the ioduret of potassium, which is almost always alkaline. I have just been adding to an acid collodion with ioduret of zinc;

which gave no proof, pulverized quick lime, this addition decided the sensitiveness.

To equalize the collodion on the plate, a manipulation is generally employed, which always succeeds: it consists in placing the plate several times successively in positions rectangular between them, balancing it sometimes to the right, sometimes to the left, while one of its angles rests on the neck of the flask to receive the excess. For the employment of the protosulphate of iron, the bath of silver should be acidulated, I used acetic acid as azotic acid did not succeed. I had only made, it is true, an experiment with a great excess. After a second examination, I acknowledge that the azotic acid is preferable, by reason of its less tendency to vaporize. In order to bring out the whole effect of the protosulphate of iron, it is necessary to add to it a small quantity of the bath of silver, which serves to render the collodion sensitive. A small quantity of the same bath, poured upon the plates on withdrawal from the sulphate of iron, singularly increases the intensity of the proofs.

The protonitrate of iron will take the place doubtless of the sulphate of iron, by reason of the facility of adding to it as much of the acid nitrate of silver as may be derived without causing a precipitate. With the sulphate of iron there is a formation of sulphate of silver and protonitrate of iron. Whatever may be the theory established it is certain that the acid protosulphate of iron with a permanent disengagement of hydrogen gas, in which plates have been often immersed, which have introduced in it nitrate of silver, reduces it in a measure into a black powder, which is deposited upon the iron and at the bottom of the vase; it is certain, I say, that this sulphate of iron gives immediately blue blacks of great purity, which will be changed by the addition of the acid argen-

tiferous bath, into absolute blacks for negatives, and to intense blacks for positives.

The collodion may receive as much as a third of its volume of rectified alcohol; ether collodion is almost pure, is more solid, but it dries too quickly, and does not preserve its sensitive state so long.

I have worked extremely quick with collodions which contained no ioduret of silver, though this is not a thing to be neglected. The operation is very simple. Ioduret of silver is precipitated by double composition, which, after a slight wash on a filter is introduced, while still damp into a small narrow necked bottle; an excess of the salt of ioduret of potassium is added to it, which is rapidly dissolved in the water which impregnates the ioduret of silver, it is heated to augment the dissolving power of the water on the ioduret of potassium, and that of the ioduret of potassium on the ioduret of silver; then, having an excess of salt and ioduret not dissolved, rectified alcohol is added, it is then filtered; this alcoholic solution will serve to iodurate the collodion, the quantity must be measured by trial with the collodion. For all the preparations of collodion, scales seem to be superfluous, the eye and the proof appear the best means of arriving at the best proportions, as most of the ingredients are very variable in their composition.

For the bath of silver 5 parts to 100 is sufficient, but it is necessary to take care to add from time to time the salt of silver saturated with ioduret by ebullition. The plate should remain about a minute in contact with a bath of silver before being raised, and applied to it immediately. A collodion which could not undergo this proof must be of bad quality, and incapable of enduring the ulterior washes.

M. A. GAUDIN.

To be Continued.

From the Journal of the Photographic Society.

ON THE EMPLOYMENT OF BROMINE IN COLLODION:

BY W. CROOKES.



HAVE for some time past been working with bromized collodion, and as, from my experience, it seems likely to become an agent of great value, perhaps the following account of some experiments with it may prove of interest to any photographer who has the time and means at his disposal, to investigate the subject more fully in its practical application.

To prepare the collodion I proceed as follows:—mix together equal bulks of sulphuric acid, sp. gr. 1·80, and nitric acid, sp. gr. 1·50; stir well with a glass rod, and then, while still warm, immerse as many pieces of good Swedish filtering paper as the vessel will conveniently hold. Allow them to remain together for one hour; then pour the liquid away, and wash the paper until free from the slightest trace of acid, and allow it to dry in a warm room.

Take 8 drachms of the purest washed ether and $\frac{1}{2}$ a drachm of spirits of wine, 60° above proof, and dissolve in this 6 grains of the above prepared paper. This collodion may be bromized in the following manner:—in a small bottle place about 2 grains of crystalized nitrate of silver and about 10 grains of pure bromide of ammonium; pour on this 2 drachms of spirit 60° above proof, and allow them to remain together for some hours, shaking the mixture several times. One drachm and a half of the supernatant liquid are to be added to every ounce of the previously prepared collodion. Thus bromized, it will remain perfectly colorless and good for a long time.

I excite the plate in a 30-grain silver bath which has been previously saturated with bromide of silver; about two minutes' stay in this bath is generally sufficient, though a little longer time does not injure it. The film of bromide of silver is a pale orange by transmitted, and blue by reflect-

ed light, and is very transparent. For developing, I prefer protonitrate of iron, being more accustomed to it, but have no doubt that in other hands pyrogallie acid would answer equally well. The above proportions of paper, alcohol, and bromizing compound may be varied within certain limits without much influencing the result. I have given the proportions which I am most in the habit of using, but would recommend that the experimentalist should ascertain for himself whether a slight departure from the above proportions would give a collodion of the consistency and strength of that with which he is most accustomed to manipulate.

The chief advantages it seems to possess over the ordinary iodized collodion, besides its great sensitiveness, are the following. In a landscape the required opacity of the more strongly illuminated parts (the sky, for instance) is not lost by over-exposure; vegetation is also more easily copied. Its superior sensitiveness to colored light is, however, most strikingly shown when colored glass or sulphate of quinine (as suggested by Sir John Herschel in p. 70 of the Journal of Pht. Soc.) is employed to absorb the strongly acting invisible rays. To prove this, I arranged several flowers and plants with a view to obtain a great contrast of color, light and shade. The best picture I could obtain of them on iodized collodion was, as I had anticipated, wanting in half-tint, very few of the colors producing an adequate impression. When, however, bromized collodion was used under the same circumstances, but with the interposition of the bath of sulphate of quinine described by me in p. 72 of the journal, Pht. Soc. every part came out with nearly the same gradation and depth of light and shade as existed in nature: this picture on brominized collodion behind the quinine bath required 40 minutes; on iodized, without the quinine 4 minutes; but when I attempted to take a photograph on iodized collodion, with the quinine bath interposed, I found that with the light I was

working in, the plate would not keep a sufficient time; there being only a faint indication of an effect at the end of 1½ hour.

I am not the first to put in practice the idea of working with only a part of the rays of light, cutting some off with sulphate of quinine or colored glass; it has been done long since by M. Edmond Becquerel

the younger and others, but still has not received that attention to which its great importance and value for special purposes would entitle it.

I am still working at this subject, but more in a scientific view than in those practical relations which alone could make it of any value to the entire body of photographers.

From the London Art-Journal.

THE PROGRESS OF PHOTOGRAPHY.—PHOTO-LITHOGRAPHY.

PHOTOGRAPHIC PICTURES ETCHED ON METAL-PLATES.



PHOTOGRAPHY, considered in its relation to art, is making rapid advances; photography, regarded as a science, is not slumbering; but we have not to

record any remarkable discovery: the new facts which have been brought forward are very few, and not particularly important.

There are, however, many points of singular interest, which appear to require especial notice in our

Journal; and to these, as marking the steps of progress, this paper will be devoted. The sudden manner in which photography has seized upon the public mind after years of neglect, proves that it had been checked by the impediments which were placed upon it; these being removed, it advances, as by a spring, at once in popular estimation; and we have photographic exhibitions displaying the beauties of the art to the world; photographic publications, instructing the eye into familiarity with the scenes which religion and history have haloed; and, the photographic society, with the Queen and Prince Albert for patrons, and Sir Charles Eastlake, the president of the Royal Academy, for its president. These are the great external evidences of the attention photography is now receiving; and beyond these, we find

every class of society, from the peer to the peasant, from the artist to the artisan, ladies as well as gentlemen, all studying the mysteries of cameras, inquiring into the curves of lenses, and eagerly soiling their fingers in the endeavors to obtain sun-pictures. Table-turning has not much that is amusing in it, and far less that is instructive; but attention to the turning of the yellow iodide of silver to a deeper brown color proves some delightful truths, and improves our perceptions of the beautiful. Truth to nature—as far as regards correctness of outline and minute detail—is one of the great advantages of photography. We know that each picture tells its story with all fidelity, and that in looking at a photograph of the temple of Dendera or of the walls of Babel, we see the whole as we should see it, did we stand upon the spot and distinguish on the stones the very grinding of the sands which, borne lightly by upon the winds, have left traces of their paths behind them. Beyond this, if we avail ourselves of the advantages of the *stereoscope*, roundness and distance are both realised and on the tables of our own drawing-rooms may we examine at our leisure, those far-distant scenes in which we are interested, without the toil of travel. So great is this fidelity, that photography is employed to register the daily progress of the great works, and the Emperor of Russia in St. Petersburg, and Mr. Vignolles in England regularly learn the state of the great suspension-bridge at Kieff, over the

Dnieper, which the English engineer is now building, by means of photographic pictures.

Notwithstanding this correctness of outline and perfection of detail, the photographic picture yet wants that delicate gradation of tones which ever marks the beautiful in nature. So great is the charm of many of these sun-pictures, that their admirers are disposed to regard them as perfect. By doing so they endanger the progress of the art; amateurs will be disposed to rest satisfied with productions which are not reflexes of nature, which are indeed only outlines of objects, wanting filling-in which is the life of all. Let us recommend as a study all photographers to take the finest picture they can obtain of any scene, and examine it by the side of a black mirror reflecting the same scene. "Looking upon this picture and on this, the counterfeit presentment," they will see wherein the one is wanting, the perfection of the other. It is not that there is not an entire absence of color, but it is that the tones which mark the receding of the landscape from the eye—which may by analogy be compared to a dissolving note of music—a dying cadence—are not realised in the photographic picture. In the productions of Mr. Stewart and of M. Martin, this has been produced with greater success than in any others in relation to landscape, and in many of the charming views of Edinburgh, by Messrs. Rose and Thomson, this realisation of "airy distance" is nearly complete. But, taking the selected production from the portfolios of either of these photographic artists, and subjecting it to the test of the mirror, it will be seen that the photograph exhibits harsh contrasts which are not to be discovered in nature. This is due to the inequality of chemical power, in the radiations from different surfaces, these being determined principally by their color; these colors observing a different order in their relation to *lights* and *shadows*, than in their light action upon the chemically-prepared surface.

The photographer may content himself with those pictures which his camera-obscura gives him, on some specified preparation, such as the iodide of silver. He may vary his results, by varying the proportions of the chemicals with which he

prepares his paper or his plate;—and, by changing his practice, as it relates to length of exposure, the character of the incident light and other circumstances, he may obtain much that is pleasing in effect. Still, he has not a true transcript of that picture which nature has thrown upon the tablet in his camera, and until he can obtain a preparation on which there is a greater equalisation of action than on the iodide of silver, he will not realise the perfection of photography.

Sir John Herschel, at a very early period recommended bromide of silver, as being superior in this respect to many other argentiferous compounds. He has, in a communication made by him to the photographic society, renewed his recommendation in all its force. The action of the prismatic image on the chemical preparation we employ, must ever be the guide by which the photographer is directed. Now the solar spectrum produces a much shorter impression on paper covered with iodide of silver, than it does on that which is prepared with the bromine of silver. In the first, as an example, the green rays of the spectrum are nearly inactive, in the second they act with some degree of energy. It has ever been observed that the masses of forest scenery are, on the photograph, represented too darkly, and that unless there has been a strong reflection of sunlight from the glazed surface of leaves, they are not impressed on the picture with relative intensity, as compared with other objects. By the use of the bromide of silver this may be to a certain extent obviated as Sir John Herschel suggests. We believe, however, that by attention to some of the combinations of the organic acids with the metals, particularly with silver, a still superior result may be obtained. A complete examination of this branch of the science is required; it is to be hoped that the photographic society will stimulate inquiry in this very promising direction.

The refined investigations of Professor Stokes have brought to our knowledge a set of luminous rays, with which we had been hitherto unacquainted. These rays exist far beyond the prismatic spectrum of Newton, having a much higher order of refrangibility than any of the Newtonian rays. By means of a solution of disulphate of quinine, or of a decoction of the

bark of the horse chestnut, this "new light" is rendered beautifully apparent, shining from the surface on which the sun's rays fall with a pure celestial blue color. It is not our intention here to analyse the researches of this able experimental philosopher further than they relate to photography. It has been long known that a class of rays, producing no sensation of light but energetically changing the white salts of silver black, existed beyond the most refrangible luminous rays of the spectrum. Over this space the luminous rays discovered by Mr. Stokes are distributed, and hence it has been inferred that the chemical rays are rendered visible. This view appears to have been adopted without sufficient consideration of all the phenomena. We know that intensity of light by no means indicates chemical power, the yellow rays of the spectrum, which are by far the most luminous, are the least chemically active of all those chromatic bands; therefore it will be evident that *light* and *photographic change* are not identical phenomena, and since the chemical power increases regularly with the diminution of light, it becomes probable that a distinct principle, a new element in fact, is involved in this disturbance of chemical affinity by radiant power. Under this view it might happen that light could be detected over every portion of the space including the chemical phenomena in question, and yet that the chemical rays were dark and invisible. It has been stated that the chemical rays are put off, by making the solar rays permeate solutions of sulphate of quinine, &c. We are not prepared to state that the extra spectral rays of the spectrum may not be interrupted, to some extent, by those media which have the power of producing the phenomena investigated by Mr. Stokes, not having as yet had an opportunity of experimenting with the required accuracy. But we know that many varieties of prepared photographic papers darken as readily behind solutions of quinine, decoction of horse chestnut bark, and blocks of uranium glass as they do when these media are not interposed between them and the sun. On the progress of photography the discovery of Mr. Stokes must have a most important bearing; but, as we have ever insisted, it is of the utmost importance to

the art, as well as to the science, to divest the mind of the influence of pre-conceived theories, and until it can be shown that the luminous relations effect these chemical changes under all conditions of illuminating power;—that light and chemical action correspond in intensity;—that the principles producing light and actinism have the same degree of refrangibility,—to regard light and actinism as distinct, at least as light and heat. It is to the incorrect ideas which prevail upon this question that the imperfection of photographic lenses are due, and until it is generally learnt that an achromatic lens is not necessarily a good lens for the chemical camera, that instrument will be imperfect. Happily Mr. Ross and some others of our opticians are now correcting their lenticular combinations, with reference to the different refrangibilities of the luminous and chemical rays setting aside the mere correction for chromatic aberration as being insufficient for the ends desired.

The stereoscope has greatly advanced the art of photography, and there is so much that is magical in the solidity of the stereoscopic picture, that numerous attempts have been made to facilitate the means of obtaining the double image necessary for that instrument. In a former article the principles were distinctly explained; by reference therefore to it the conditions necessary will be fully understood. It may not however be without its advantages to state that the pictures required for the stereoscope are in all essentials those which are seen by the right and left eye respectively, which, by their combination in the instrument, faithfully represent bodies having length, breadth, and thickness. We hear of attempts to render the stereoscope available to the purposes of public exhibition. There are no doubt many difficulties in the way of this but by an arrangement not very dissimilar from that which was employed in the Cosmorama—at least fifty people might at a time be surveying objects of interest—represented in the perfection which belongs to the solid image, and truth in all the relations of distance. It has become an object of great scientific interest to obtain photographic images of the moon, by which we may be enabled to determine the height of the lunar mountains, the depth of the

lunar valleys. To do this effectively it appears necessary to obtain images at the two extremes of the moon's librations: an interval of about eighteen months therefore must elapse between the times of obtaining the two images, but when obtained they would completely exhibit the physical character of the surface of our satellite. The British Association have undertaken the work of examination, and its secretary, Professor John Phillips, and a committee of its members, are engaged in devising the requisite apparatus for securing the impression of telescopic images of the moon on photographic plates.

It is no less important to secure by the same means stereoscopic images of the sun. They would enable us to determine with a degree of certainty, not hitherto obtainable, the exact character of the solar spots. We have from time to time noticed the beautiful photographic publications which have been brought out in Paris; we have to add to these some exquisite productions illustrative of various branches of natural history, which are now in course of publication.

Anything more beautiful in minute detail than these can scarcely be conceived, and we learn from some of our most eminent naturalists that the accuracy of these photographic representations of the objects of their study is far greater than that which can possibly be attained by the most skillful artist. The original copy is made either by the collodion process on glass, or the albumen process, and from this original any number of pictures can be obtained, each one of equal excellence in every respect. The price at which these beautiful plates are sold is so very moderate that any one pursuing the study of natural history may without difficulty procure them.

There has been much interest excited recently by the circulation of prints taken from stone—the impressions on the stone having been obtained by the agency of the solar rays. The method which has been employed to obtain these photographic images upon the lithographic stone, is the same as that devised by the elder Niepce, and introduced to the notice of the Royal Society in the year 1830. This heliographic process of M. Nicéphore Niepce consists, as now employed, of spreading upon the stone some bitumen of Judea dissolved

in essential oil of lavender. This being uniformly spread over the surface forms the photographic surface. M. Niepce observed that all resins when exposed to light became more soluble than when kept in darkness. Many resins, particularly the bitumen of Judea, or as we call it, Jews' pitch, are very sensitive to this influence, and even in the weak light of the camera the change is effected in a few hours. In the present examples the camera picture is first attained by any of the well known calotype processes, and this being properly fixed, is placed upon the stone pressed close by means of a glass, and exposed to the sunshine. The strong lights in nature being represented by shadows in the original negative picture, and the natural shadows by lights, a positive and correct impression is obtained upon the stone. The sun's rays passing through those parts of the negative which correspond with the shadows in nature, acting powerfully upon the resin on the stone, a well-defined portion of that resin is rendered far more soluble than that which is under the darkened portions of the paper. An exposure to sunshine for a period varying from half an hour to an hour is sufficient; the surface of the stone is then exposed to the action of the solvent—almost any kind of spirit may be used—care being taken that it does not remain sufficiently long to attack unchanged resin. The stone is then placed under the flowing water, and well washed. By this process the stone is left bare over all those parts which correspond with the shadows, the lights being still covered with the resin. The lithographic stone is now treated in the ordinary manner to prepare it for printing, and the resin is removed from the other parts. In this manner it will be seen one portion of the stone is fitted to receive the ink, while the other portion will not take it from the roller, and the impressions are taken in the ordinary manner. We are not certain the artist has not aided the results which we have seen by some touches subsequently to the photographic action; without these we do not clearly perceive how such nice gradation of tone should have been obtained as that which marks some of the architectural pictures. Photo-lithography promises much already; the results are of the most favorable kind; and if these results are but slightly improved upon,

we may expect to see it employed for the purposes of book illustration.

MM. Niepce de Saint Victor and Lemaitre have been working by the same process upon steel plates. The elder Niepce having removed the resin from the plates over those parts on which the solar rays had acted, etched those parts with nitric acid; his nephew and M. Lemaitre are endeavouring to improve this process. Many pictures produced by this process have been circulated in this country, and although curious they do not appear to promise such complete results as the daguerreotype etchings obtained by the process of M. Fizeau and of Mr. Grove. They are merely intense whites and blacks, the middle tints being entirely wanting. It will be readily seen that this must constantly be so with this process, since where any resin remains on the plates it must protect the metal from the action of the acid. The only method by which this can be obviated is the very tedious one of alternating the operations of the acid with the action of some spirits as a solvent of the different layers of resin. By this means, and judiciously adopting the process of "stopping out," it appears possible to produce the required middle tints.

In M. Fizeau's process, advantage was taken of the different rates of action, upon those parts of the silver-plate which were left bright, and those which were covered with mercurial vapor, so that the amount of chemical action bore an exact relation to the thickness of those films, which produced the delicate lights and shadows of the daguerreotype picture. We have seen specimens of this process full of the most minute detail; as, for example, the nervous system of *Aplysia* and of *Tritonia Hombergii*, together with copies of statues and portraits, in which every line was preserved, and each shade most delicately given. This process failed from the circumstances that the silver plates were too soft to admit of many impressions being taken off by the press. It always appeared, however, that it was easy to obtain electrotype copies of these etched plates, and by using these instead of the original, obtain any number of impressions.

In Mr. Grove's process, the daguerreotype plate was made one of the terminal poles of a voltaic battery; and another

plate of equal size formed the corresponding termination of the other pole. These plates were plunged into a solution prepared for etching; and accordingly as the parts of the plates were pure silver, or an amalgam of silver and mercury, so was the degree of electro-chemical action excited. Many exceedingly beautiful results were thus obtained; but, as in M. Fizeau's process, the softness of the silver became the chief objection to its use, so it prevented Mr. Grove's method being employed. The probability is that one, or perhaps both, of these processes will be returned to, as promising a greater degree of effectiveness than any others.

Mr. Fox Talbot has lately been circulating examples of etching upon steel-plates, which have much to recommend them. At present, however, they labor under the defect already described in noticing the resin process,—the absence of the middle tints.

Availing himself of Mr. Mungo Ponton's process, published in the *Edinburgh Philosophical Journal* for the year 1840, in which the bichromate of potash is employed, Mr. Talbot proceeds in the following manner:—

A solution of gelatine has some of the bichromate of potash dissolved in it, and this is poured over the surface of the steel plate and dried. There is thus formed a very perfect coating of gelatine, having a fine yellow color. Upon this is placed the object to be copied, fern leaves, grasses, or pieces of lace; these are pressed closely by a piece of glass and exposed to sunshine. The bichromate of potash is decomposed by this exposure, and the chromic acid, attacking the organic matters, produces a brown and opaque surface. This contrasted with the portions protected from light by the superimposed objects gives a very pleasing picture. The parts of the gelatine which have remained without change are very soluble; those which have combined with the chromic acid are tolerably insoluble. The plate therefore being placed in water, all the portions corresponding to the objects superimposed are removed, and the steel left bare along these lines, all the other parts being still covered with the gelatine. A solution of bichloride of platinum is now poured upon the plate, and the lines

are rapidly etched in ; when this is effected the plate is washed, and all the gelatine is removed, and it is submitted to the operations of the copper-plate printer. In this way very delicate copies of grasses, or textile fabrics, and similar objects, have been obtained. It is possible that other processes may be discovered of a more delicate character, by which the images of the camera obscura may be depicted directly on the plates, and that practice and experiment will direct to some method for securing all those gradations of light and shade which are required for the truthful representation of nature.

We might occupy still further space

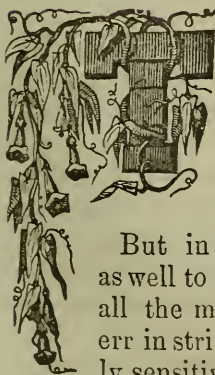
with some notice of the progress making in the application of photography to the microscope, but as we hear of several important investigations being now in hand, promising most satisfactory results, we deem it advisable to postpone our consideration of this portion of the subject to a future occasion.

The photographic society has brought the labors of its first session to a close. Most photographers armed with the camera have started, or are starting on their campaigns, and we have no doubt that the Christmas exhibition promised, will furnish ample proofs of well-directed energy and untiring labor.

From the Journal of the Photographic Society.

ON A NORMAL COLLODION, AND ON IODIDE OF IRON.

Extracts from letters to R. Fenton, Esq., by A. Maconochie, Esq.



THE notice of the Count de Montizon's paper on the collodion process is much too brief to enable me to discover whether he has adopted my views upon the subject of *collodion*.

But in case he has not, I think it as well to mention, that in my opinion all the makers of prepared collodion err in striving to produce an extremely sensitive collodion from *the first*. I believe it is infinitely preferable that a good, steady, *stable*, normal collodion should be produced, which will keep its qualities for a length of time, than that highly sensitive compositions should be aimed at, which are necessarily always unstable and which may be very sensitive for a short time, but sooner or later lose their sensitiveness and even become useless. My method is to make, as stated, a good stable collodion, which I iodidze *chiefly* with an alcoholic solution of double iodide of silver, formed by precipitating ammonio-nitrate solution of silver, formed by a solution of iodide of potassium, and redissolving (or nearly so)

all this precipitate, after well washing it in several waters and in alcohol, by means of an alcoholic solution of iodide of potassium and a trace of bromide of ditto ; and the alcohol so iodized is what I use for mixing with the æther to render it a solvent of the cotton.

I allow the mixture of ether and iodized alcohol to rest for some time, and I pour *carefully* off the clear portion, taking care that none of the excess of potassium or precipitate which will be found at the bottom passes over, and to the said clear portion I add my *soluble* cotton (*gun-cotton*.)

This is my normal collodion ; the proportions are of course easily regulated.

It serves very well for still life and where time is no object, but it can be rendered *instantaneously* sensitive by the addition of an iodide of iron, which iodide is made so as to be *stable* and *permanent*. This addition operates almost immediately on the collodion, a couple of drops to each ounce being in general sufficient.

In this way a small portion of the collodion stock is left untouched to maintain its original qualities for any length of time ;

indeed, it seems to me to improve. Of course the bottles containing it must be kept well *corked* and *nearly* full.

The sensitive bath is used stronger in proportion to the amount of iodide of iron added, and the collodion can be rendered so sensitive that the picture can be traced on the plate before the developing agent is applied.

I took a view last June of the inauguration of the Duke of Wellington's statue in Edinburgh, and having arranged so as to open and close the operation of the lens instantaneously at the moment of uncovering the statue, and the *canvas* covering in the *act of falling* down, although there was a thunder storm at the time and the rain falling in torrents.

My idea, then, is to aim at a good, stable, normal collodion, with some ready, easy method of *instantly* giving it any required degree of sensitiveness.

To these ends I think I have approximated.

Next, as all instantaneous views are thin, and too transparent to form, a *good* negative for printing from, the next object is to obtain some means of *adding* to the silver deposit, and at the same time rendering it more or less impervious to light. Bichloride of mercury and several of the sulphurets have been used; these, however, though to a certain extent they are productive of the effect required, yet in fact they do little else than blacken or render less transparent the silver deposit, but scarcely add anything to it; whereas chloride of gold, *when* properly applied, not only intensely blackens the positive picture, but adds a deposit of gold to the deposit of silver already on the plate. By means of it, I have been able to print from positive pictures as forcibly as if they had been negative from the first.

IODIDE OF IRON.

In your letter you inquired the method I pursue, for obtaining a tolerably stable iodide of iron. In reply, I may say, "By long cooking;" *i. e.* I place about two drachms iodine and $\frac{1}{2}$ a drachm of clean soft iron wire (the proportions are not of consequence) in a Florence flask, to which has been fitted a cork with a glass tube, as in a common gas bottle. Into the flask is to be poured, say 6 or 8 ounces of alcohol,

and the contents shaken together; then fit in the cork and pipe, and insert the other end of the pipe into a bottle placed in a bowl of water, and the flask having been arranged so as to have a gas or other lamp placed under it, set it gently boiling, till the alcohol is more than half distilled over. Keep restoring the alcohol thus distilled as often as it amounts to half the original quantity, and supply any loss by adding a little fresh alcohol.

This operation being necessarily carried on only at times when it can be watched at regular intervals, may occupy, say a *considerable* portion of two days.

Next add 2 or 3 drachms of glacial acetic acid to this well boiled alcoholic solution of iodide of iron, and repeat the boiling and distilling process. But distil now until two-thirds of the fluid has come over, and then add *fresh* alcohol, and so go on till *all* the acetic acid and ether has been distilled away; then allow the solution to settle and pour it into a stoppered phial for use. But observe that you are to *conclude* the process of boiling and distillation by leaving only *one half* of the original quantity of alcohol in the flask, so as to concentrate the solution of iodide of iron.

This I have found to be very stable, and a few *drops* should be added to each *little* phial of *prepared* collodion some hours before using.

For paper positives I use 3 or 4 grains of hydrochlorate of ammonia to each oz., of rain or distilled water, and to this I add as much solution of chloride of gold as will color the solution to the tint of orange juice.

The paper is floated over the above, and is rendered sensitive by floating it when dry over the ordinary 50-grain solution of ammonia nitrate of silver, with this addition, that, after making the ammonia nitrate, I leave the ammonia a *very* little in excess, and then drive it off by setting the bottle containing it for an hour or two beside a fire, and then I filter and keep it for use. I find that this mode of treatment renders it *very much less liable to decompose*.

The paper coated as above should be used, *i. e.* rendered sensitive and used, before many days elapse, otherwise it becomes of a purplish tint, especially if kept

exposed to air and light. Very intense tones can readily be obtained in this simple manner.

Canson's *medium* thickness of positive paper I like the best.

For opening and closing my camera, I use an oblong piece of metal plate with a circular opening in it, and with two shoulders or notches. This slides *easily* up and down in grooves fastened in front of the lenses. It is kept suspended by a cord passing over a pulley fastened to an upright holder in front of the camera, and when thus suspended closes the lenses. On letting go the cord, the plate falls easily and *instantly*, without shaking the camera; and in falling, the hole in it corresponds with the diaphragm of the lenses, and so exposes the plate momentarily to the action of the light; the shoulders of the plate arrest it and keep it from falling through, and its upper half then closes the lenses.

It has the advantage of opening the camera either by pulling up or letting fall; and it may be placed either in front, as I

use it, or behind the lenses, a tube in this case being inserted in the camera so as to cut off the light.

In March last, I obtained a clear and distinct image of the breaking of the tidal wave on the beach, as a *foreground* to a view of a part of the Firth of Forth at New Haven, near Edinburgh.

Pray excuse all this long story; I really cannot be sure that it may not *all* be what we call in Scotland "Piper's news," or Anglice, "teach your grandmother." But on the chance that some of it may be novel, I have troubled you with it, and at all events it will at least serve to prove my good will.

I still adhere to the idea I formerly intimated to you, viz, that the Society should endeavour to obtain a certain and precise formula for a good *stable* collodion, and an appendix to that in the shape of some mixture like that of the iodide of iron, by which it can be rendered more or less sensitive according to circumstances.

HYDRIODATE OF BARYTA—IODATE OF BARYTA.—This salt is composed of one part iodic acid and one of baryta, and may be formed by dissolving the baryta in the iodic acid. Hydriodate of baryta possesses advantages over every other *simple* hydriodic solution, both as regards quickness of action and the sharpness of outline. A solution may, however, be made still superior to it, by combining a portion of iron with it. Forty grains of the hydriodate of baryta being dissolved in one ounce of distilled water, five grains of very pure sulphate of iron should be added to it and allowed to dissolve slowly. Sulphate of baryta is precipitated, which should be separated by filtration, when the solution is composed of hydriodate of baryta and iron. By now adding a drop or two of sulphuric acid, more baryta is precipitated, and a portion of hydriodic acid set free. The solution must be allowed to stand until it is clear, and then carefully decanted off from the sediment, as filtering paper

decomposes the acid, and free iodine is liberated. By this means we procure a photographic solution of a very active character. It should be prepared in small quantities, as it suffers decomposition under the influences of the atmosphere and light.

HYDROCHLORATE OF AMMONIA.—This salt is prepared by mixing an excess of ammonia with the hydrochloric (muriatic) acid; it is then evaporated by gentle heat and left to crystalize. It is very soluble in alcohol. Advantage can be taken of this property to prepare the photographic paper, first with albumen simply; then, the albumen being dry, place the albumenized side, in a bath of alcoholic at 36° containing 5 per cent. muriate of ammonia. The alcohol congeals the albumen and thus dispenses with the necessity of passing a hot iron over it. This salt attracts much less moisture from the air than the chloride of sodium, and this property renders it much more preferable for the preparation of positive paper.

From the Journal of the Photographic Society.

NEW PROCESS FOR COPYING ENGRAVINGS AND DRAWINGS.

BY M. NIEPCE DE ST. VICTOR.



CHEVREUL has just laid before the Academy of Sciences a new process by M. Niepce de St. Victor, or rather a further step in a process already made known by that well known heliographer, rendering it applicable to artistic purposes.

M. Niepce, in his communication, first refers to his memoir published in 1847, on the "peculiar properties of certain chemical agents," in which he called attention to the action of various vapors, especially that of iodine.

He stated that the vapor of iodine attached itself to the blacks of an engraving, to the exclusion of the white portions, and that the image might be reproduced on paper sized with starch, or on a glass plate coated with starch made into a liquid paste; that by this means a picture was formed in which the colored substance consisted of iodide of starch; but these pictures were not very permanent, although he had employed various means to fix them.

He now makes known a method of rendering them unalterable.

If, after obtaining a picture in iodide of starch, on paper or glass, according to the process described in 1847, the picture is dipped in a solution of nitrate of silver, the image disappears; but if the paper or glass is exposed to the light for a few seconds, the following results will be obtained:—the original picture, which was of iodide of starch, becomes transformed into iodide of silver, and by exposure to light, this iodide, being much more sensitive than the nitrate of silver contained in the paper or the layer of starch paste on the glass, is acted on sooner than the nitrate; then it suffices to plunge the paper or glass into a solution of gallic acid, to bring out immediately the original image, which is then treated with hyposulphite of soda, exactly as is done with ordinary photographic pictures.

By means of this last operation the picture becomes as permanent as ordinary photographic pictures; this new process will certainly be practised for a variety of purposes.

M. Bayard, the skillful photographer, has just made another application of the vapor of iodine, namely, after having exposed the engraving to the vapor of iodine, he applies it upon a glass prepared with albumen, to furnish a negative picture or *cliche*, from which he can print positive pictures by the methods well known to photographers. By this means he has obtained magnificent reproductions of ancient engravings without any disfigurement of the pictures.

These two last applications prove most distinctly that the vapor of iodine, as M. Niepce said long ago, attaches itself to the black parts of engravings and drawings in preference to the whites.

Four of M. Bayard's pictures obtained by these processes accompanied the communication to the academy; M. Chevreul submitted them to the examination of his colleagues, with the observations, that the author, whose name is well known to the academy, and who has already rendered numerous services to photography, "regards them merely as trials, and desires the academy to look upon them as such," which, however, did not prevent many of the members expressing their admiration of these specimens.

It was clear that the problem of the reproduction of engravings without disfigurement, whatever their dimensions may be, was finally solved, since the engraving or drawings themselves were here reproduced by contact, without the necessity of having recourse to the camera or other instruments which could not give results equally satisfactory, even if they had attained the highest degree of perfection.

The celebrated director of the Gobelin manufactory (M. Chevreul) was peculiarly the person to show the full value of the

long and persevering labors of M. Niepce. Listening attentively to the clear explanations given by this learned chemist, we were reminded that M. Chevreul long ago appreciated at their just value the discoveries made by the author of this communication, and that he had given a *resume* of his opinions in a memorable report "Considerations on the reproduction, by M. Niepce de St. Victor, of engraved, drawn or printed images," in which report he passed in review all the properties of the chemical agents noted by the author, and which he terminated thus: "These details, concerning one who during twenty three years (1847) has constantly satisfied all the requirements of the military profession, without hesitating at any sacrifice his taste for scientific researches imposed upon him, will not appear out of place, and I dare to hope that the academy will accord a testimony of esteem to M. Niepce de St. Victor, who doubly honors the title of a French officer."

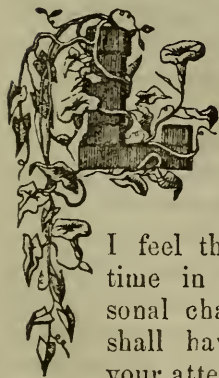
M. Chevreul had scarcely closed his address to the academy, when the perpetual secretary arose, and, recalling the labors

of M. Niepce, the numerous steps in advance he has made for the science, proposed to make known a wish that the government should accord to Capt. Niepce a position which, by fixing him in Paris, would permit him to continue his interesting and useful researches. These words were received in the most favorable manner; but at the same moment, Marshal Vaillant, member of the academy, who had found occasion to make known to the Emperor the labors of M. Niepce, announced to the president that his Majesty, always full of solicitude for whatever is in the interest of science, had already, from his own motives, forestalled the wishes expressed by the academy, in giving to M. Niepce a position which exceeds the hopes of the modest *savant*, and places him in a position to continue his scientific researches.

This special mark of the favor of the prince, and these testimonies of sympathy on the part of our most celebrated *savans*, must make the laborious inquirer forget many an hour of anxiety and discouragement.

From the Manchester Examiner.

CARDINAL WISEMAN'S LECTURE ON THE CONNECTION BETWEEN THE ARTS OF PRODUCTION AND THE ARTS OF DESIGN.*



LADIES and gentlemen, I ought certainly to commence my address to you by thanking you for the extremely kind manner in which you have been pleased to receive me, but

I feel that I must not waste your time in mere expressions of a personal character feeling rather that I shall have to tax your time and your attention to a considerable extent. I will, therefore, enter at once upon

the proposed subject of my address, which has already been communicated to you by my old and excellent friend the Bishop of Salford. And I am sure I need not say, for he already has well expressed it to you, that it is a topic which at this moment has engaged its full share of public attention,

invited Cardinal Wiseman to deliver an address upon some literary subject of general popular interest. Accordingly on the 28th of April last, in the Corn Exchange, Manchester, his Eminence spoke for three hours, as follows. We know not that we have ever read anything so calculated to inspire the true sentiment of Art among the working people. Those who are interested in the establishment of Schools of Design in our country, could not ask a better presentation of the importance of their cause.--*Dwyht's Musical Times*.

* In the spring of 1852, an association was formed by the Catholics of Manchester and Salford, England, to raise funds for the education of the poor. The Committee, in aid of this purpose,

as drawing to itself the interest of all the educated classes, and is in fact a topic connected with important questions, the solution of which may have to exert an important influence not only on our social but likewise on our moral progress.

While I wish, however, to escape from the tediousness of a long introduction, I feel that I shall be naturally expected to say a few words on the motives which have induced me to select this particular topic for the city of Manchester. I must be conscious, and it must be obvious also to many, that there are present persons who are much more able to instruct me upon such a subject than I can pretend to be to instruct them. There are persons to whom the topics and the questions connected with my subject have not been merely a matter of recreation and pleasurable pursuit, but a subject of earnest study—the occupation perhaps of their lives, and a duty to themselves and their families. Now, gentlemen, were I come here with a pretence that I could give you any instruction upon practical matters connected with the great business of this city; did I presume to assert that I was going to give you some information regarding the details of the productive art, for instance—which were new to you all—I certainly should deserve to be received with anything but that kind indulgence which you have already forestalled me, and which I feel you are disposed to extend to me. I should deserve to be treated as was a much greater personage of old—the Emperor Alexander, who Pliny, tells us, was in the habit of visiting the studio of the celebrated Apelles. When on one occasion he began to discourse with that artist concerning his profession, Apelles, with that frankness which was the privilege of so eminent a man, said to the Emperor, “Hush! if you continue to speak that way, my very color-grinders will laugh at you.” And if I did not require so strong a demonstration of disapprobation, I might expect some within themselves to think of me as Hannibal did of that old philosopher, who promised to give a lecture in his presence on the science of war. I come, therefore, with no such pretensions as these. I have come before you as one who has passed many years in contact and familiarity with art—who has been, perhaps, no negligent observer of

what occupies the public attention—who has endeavored to master a topic, the influence of which he sees to be so important upon a class in which he might feel the greatest interest—namely, the poor—whom it is his duty to assist in educating, and more and more feels that he has a right, and perhaps even a duty to claim indulgence, and to communicate whatever he feels that he is prompted to speak, with the highest and best of motives—the desire of being beneficial to his fellow-creatures. (Loud applause.)

The topic on which I have to address you, then, is the CONNECTION OR RELATION BETWEEN THE ARTS OF PRODUCTION AND THE ARTS OF DESIGN.

By the Arts of Production, I mean naturally those arts by which what is but a raw material assumes a form, a shape, a new existence, adapted for some necessity or some use in the many wants of life. Such is pottery, such is carving in its various branches, whether applied to wood or to stone; such is working of metals, whether of gold, or silver, or brass, or iron; such is the production of textile matters—of objects of whatever sort and for whatever purpose; such is construction in its different branches, commencing with the smallest piece of furniture, and ascending to a great and majestic edifice. By the Arts of Design, I understand those which represent nature to us in any form, or which bring before us beauty, whether in form or in color.

Now those arts ought, as every one agrees, to be in close harmony one with the other; but that harmony which I wish to establish between them must be an honorable union, an equal compact, a noble league. There is not to be one the servant and the other the master; each must be aware of the advantages which it can confer. Thus the arts, for instance, of design, will have to give elegance of form, grace of outline, beauty of ornament, to that which is produced by the other class of arts; and they in their turn have to transmit, and multiply, and perpetuate the creations of the arts of design. Now it is agreed on all hands that as yet this complete harmony does not exist; that we have far from arrived at that mutual application of the one class to the other, which gives us a satisfactory result. It is unne-

cessary, I believe, to bring evidence of this. As we proceed, I trust that opportunities will present themselves of bringing before you authorities enough for that assertion. But I may say at the very outset that the report which is published by the department of practical art, is almost based upon the acknowledgment that as yet we have not attained that application of the arts of design to the arts of production which we desire, and which is most desirable to the arts of production to obtain. It acknowledges the existence of a necessity for much more instruction than as yet has been given. It allows that for several years—thirteen years, at least—of the existence of schools of design, they have not been found fully to attain their purpose, and a new organization and a new system has begun to be adopted. No one can appreciate, I trust, more than I am inclined to do myself, the advantages which must result from the multiplication of these schools of design as applied to manufactures, and other great improvements which they have already begun to confer, and will continue, no doubt, still more to bestow upon the industrial classes. I believe it most important to propagate to the utmost the love of science—the love of Art. I believe it most useful to accustom every child even to its first rudiments, its elementary states. I think that if we can make drawing a part of universal education, a great deal will be gained. But this, certainly, cannot be enough. I am willing to grant that we shall have a great improvement upon what we have produced in the form of Art. I believe that we shall see better designers—men with better imaginations—men who understand the harmony and combination of colors better, and who can give to the artisans patterns which will greatly improve every department of our industry. But, I ask, is that sufficient? Will this bring Art up to what we desire? This is the great question. This is the subject of which I am going to treat. It appears to me that there is a very simple mode of looking at it, and it is the one, consequently, which I shall adopt. It is a question partly of experience. It is a lesson much of which history can teach us, and I desire to bring before you such facts as seem to me to bear upon the question, and to enable us to come to a practical and satis-

factory conclusion. (Applause) I will endeavor to state the question under a very simple, but perhaps it may appear not a very practical form.

There is now a great desire to form not only in the capital, but also in all great cities where industry prevails, museums which should contain all the most perfect specimens of art which antiquity in all ages has left us of beauty in design and elegance in form. We wish that our artisans should have frequently before them what may be considered not merely actual models to copy, but likewise such objects as may gradually impress their minds with feelings of taste. Now I should like to have the construction, the forming of such a museum as I should wish the city of Manchester to enjoy. And in describing it I will confine myself entirely to one small department, that of classical Art—classical antiquity—because I know that for a museum intended to be practical to the eyes of artisans there is a far wider range of collection to be taken than that to which I will confine myself. Well, now, I imagine to myself a hall at least as large as this, and of a more elegant and perfect architecture. I suppose it to be formed itself upon classical models, and around it shall be ranged not merely plaster casts, but real marble statues and busts collected from antiquity. I would range them round the room so that each could be enjoyed at leisure by the student. There should be room for the draughtsman to take a copy from any side. In the centre I would spread out a beautiful mosaic, such as we find in the museums, for instance, of Rome, or pavement in rich colors, representing some beautiful scene, which should be most carefully railed off, that it might not be worn or soiled by the profane tread of modern men. There should be cabinets in which there should be, but enclosed carefully with glass, so that there would be no danger of accident, the finest specimens of the old Etruscan vases of every shape, plain and colored, enriched with those beautiful drawings upon them which give them such character, and at the same time such price. And on one side I would have collected for you some specimens of the choicest produce of the excavations of Herculaneum. There should be bronze vessels of the most exquisite carving, and there should be all sorts

even of household utensils, such as are found there, of most beautiful shape and exquisite finish. On the walls I would have some of those paintings which have yet remained almost unharmed after being buried for so many hundreds of years, and which retain their freshness, and would glow upon your walls and clothe them with beauty, and, at the same time with instruction. And then I would have a most choice cabinet, containing medals in gold and silver and bronze, of as great an extent as possible, but chiefly selected for the beauty of their workmanship; and so engraved gems likewise, every one of which should, if possible, be a treasure. Now, if such a museum could be collected, you would say, I am sure, that so far as classical antiquity goes—classical Art—you have everything that you could desire, and you have as noble, as splendid, as beautiful a collection of artistic objects as it is within the reach of modern wealth and influence to collect. In fact, you would say, if you could not make artists now by the study of these objects, it was a hopeless matter, because here was everything that antiquity has given us of the most beautiful.

Now I am afraid that while you have been following me in this formation of an ideal museum, you have thought it required a stretch of imagination to suppose it possible that such a collection could be made in any city of England. I will ask you, then, now to spread your wings a little more, and fly with me into even a more imaginary idea than this. Let us suppose that by some chance all these objects which we have collected were at some given period, in the first century of Christianity, collected together in an ancient Roman house; and let us suppose that the owner of the house suddenly appeared amongst us, and had a right to claim back all those beautiful works of Art which we so highly prize, which we have taken so much trouble, and laid out so much money to collect. Now what does he do with them when he has got them back? Why, what will he do with those statues which we have been copying, and drawing, and admiring so much? Pliny finds great fault, is very indignant with the people of his age, because he says they have begun to form galleries, *pinacothecas*; that such a thing was unknown before; that no real Roman should value a

statue merely as a work of Art, but that it was only as the statues of their ancestors that he ought to value them as nothing else. He takes them back, he puts the best of them, not in the centre of a room where it may be admired, but to him it is a piece of household furniture, and he puts it with all its fellows into the niches from which they have been taken, and where they are, perhaps, in a very bad light. It is exceedingly probable that if the statues were not of his ancestors, he would, instead of allowing them to remain in the beautiful hall prepared for them, send them into his garden, into his villa, to stand out in the open air, and receive all the rain of heaven upon them. The mosaic which we have valued so much, and which is so wonderful a piece of work, he will put most probably into the parlor of his house to be trodden under foot by every slave that comes in and goes out. And now he looks about him at that wonderful collection of beautiful Etruscan vases which we have got together, and he recognizes them at once; "take that to the kitchen, that is to hold oil;" "take that to the scullery, that is for water;" "take these plates and drinking cups to the pantry, I shall want them for dinner;" and those smaller—those beautiful vessels which yet retain as they do the very scent of the rich odors which were kept in them—"take them to the dressing-rooms, those are what we want on our toilet; this is a washing-basin which I have been accustomed to use; what have they been making of all these things to put them under glass, and treat them as wonderful works of Art." And of those beautiful bronze vessels, some belong again to the kitchen, others belong to our furnished apartments; but every one of them is a mere household piece of furniture. And then he looks into the beautiful cabinet, and he sends those exquisite gems into his room, to be worn by himself or family, as ordinary rings; and your gold medals, and silver medals, and bronze medals, he quietly puts into his purse, for, to him, they are common money. Now, then, here we have made a collection of magnificent productions of Art; and, in reality, these were all the fruits of the arts of production. (Cheers.)

Now, what are we to say to this? We are to say that there was a period in Rome,

and there were similar periods in other countries at different times, when there was no distinction between the arts of production and the arts of design, but those very things which to us now are objects of admiration as artistic work, were then merely things made and fashioned as we see them for the ordinary uses to which we adapt other things of perhaps similar substances, but of a very different form. For, in fact, if you had these vessels, you would not know what to do with them. We could not cook a dinner in them. We certainly could not adapt them to our common wants. But to the Romans they were the very objects which were used for those purposes; and although now in reading the old writers, and trying to make out the dreadfully hard names by which all these different pieces of pottery are called, yet, learned and classical as all that may be, when we come to translate these high-sounding Greek names into English, we get very modest results—pipkins, and basins, and ewers, and flagons, and such homely names as these. (Applause.) It is inherent in it; it was created with it.

Then what I fancy is desired, is, that we should bring Art back to that same state in which the arts of design are so interwoven with the arts of production that the one cannot be separated from the other, but that which is made is by a certain necessity made beautiful. And this can only be when we are able to fill the minds of our artisans with true principles, until really it has pervaded their souls, and until the true feeling of Art is at their fingers' ends. (Loud applause.) You will see, I think, from the example which I have given you, what is the principle at which I am aiming, which I wish to establish. It is this: that at any period in which there has been a really close union between the arts of production and the arts of design, this has resulted from the union in one person of the artist and the artisan.

Such now is the principle that I am going to develop; and, in doing so, I will distinguish between arts of production to two distinct classes. There are those in which necessarily there is manipulation—the use of the hand, or of such implements as the hand directly employs; and there are those in which mechanical ingenuity is employed in the art of production.

It is clear that these two must be treated distinctly, and I will begin with the first, which affords the greatest number of illustrations and examples in proof of that principle which I have laid down.

I will begin first, then, with illustrations from metal work. Now, the period in which there was the greatest perfection in this sort of work, as is universally acknowledged, is from about the fourteenth century—1300, I think, to 1600, or at least after 1500. It is singular that in that period five at least, very probably more, but we have it recorded of five of the most distinguished sculptors whose works are now the most highly prized, that they were ordinary working goldsmiths and silversmiths. This is given us in their respective lives; Benvenuto Cellini, Luca della Robbia, Lorenzo Ghiberti, Brunelleschi, and Baccio Bandinelli, all of whom were goldsmiths and workers at first, and developed most extraordinary talent as sculptors. How was this done? Can we conceive a person who is merely a workman, working upon such plate as is put before him, becoming a man of high first-class character in Art? There have been examples, as we should see, but they are rare. But here we have five men, in a limited period, becoming most eminent. Now what was the reason of that? It was because the jeweller, the silversmith, who worked with his hands, was considered of necessity to be educated not only as an artist, but an artist of the highest class; and Vasari observes, in the life of Bandinelli, that in those times no man was reputed a good goldsmith who was not a good draughtsman, and who could not work as well in relief. We have a principle then established, that the person who did the material work in the finer works was an artist who could not only draw but model; and did the same with the metal itself, for that is the nature of that class of work of which I have spoken.

Now, take the life of Cellini. There was a man who originally was put to a totally different employment. His father had no higher ambition concerning him than that he should become a great player upon the flute, and he teased him during all the last years of his life because he had no taste for this, and would run after goldsmiths and others, and learn the different

branches of his profession. He led the most wonderful life. He was to-day at Rome; next day at Florence; then he was at Naples; then at Venice; then in France; then back again; in fact, it seems incredible that he could have done any work to any one who reads his life. And he did not travel by train or by any public conveyance which could take on his luggage. He traveled on horseback each time from Rome all the way to Paris. He had no luggage; he was a poor man, and whenever he came and started his shop, he began by making often his own tools; and he worked, with his scholars, who were generally young men that became themselves eminent in the profession, in a little open shop, looking to the street; and there he himself hammered, and carved, and cast, and shaped, and did whatever else was necessary for the work. He was an actual working goldsmith, and the beauty of his works consists in this, that they have the impress of his genius so marked upon them that they never could have been designed by one person and executed by another. There is as much art in the finish by his own hand in every enamel, in the setting of every stone, as there is in the entire design; nor does he ever dream of talking of himself in any other way; and yet how he went on from step to step, until at length he produced the most magnificent works, on the largest scale, in marble and bronze! And he describes how he constructed his Perseus. He went to buy his own wood, and saw it brought, and when he was casting that most exquisite statue of Perseus, which is still one of the wonders of Art, he had every sort of misfortune. His furnace blew up, the roof was blown off; and the rain came in torrents upon the fire just the moment that the metal was going to be poured in. By his ingenuity, his extraordinary contrivances, he baffled, it might appear, the whole chain of accidents, and brought all out, almost without a flaw, that most perfect piece of workmanship. You may imagine to what a state he was reduced when, the very moment that the metal was ready for pouring out, the explosion took place. He had no other resource but to run to his kitchen, as he says, and to take every piece of copper, to the amount of 200 porringers and different sorts of

kettles, and throw them into the fire, and from these that splendid statue came forth. There was genius. (Loud cheers.)

As a curious instance of the most extraordinary ingenuity, he tells us that on one occasion a surgeon came into his shop to perform an operation on the hand of one of his pupils. Upon looking at his instruments he found them, as they were certainly in those days, so exceedingly rude and clumsy that he said—"If you will only wait half an hour, I will make you a better instrument;" and he went into his workshop and took a piece of steel, and brought out a most beautifully finished knife, with which the operation was successfully performed. Now this man, at the time you see thus working, as I said in his shop as a common workman, was modeling in the most exquisite manner in wax, spending his evenings in the private apartments of the Grand Duke, modeling in his presence, and assisting him with a hundred little trifles which are now considered treasures of art. And so wherever he was, and under all circumstances, he acted as an artist, but at the same time, as a truly laboring artisan. It was the same with others in the same profession. He was not the only man, by any means, whose genius was so universal; because we find him telling us repeatedly that the moment he heard of some goldsmith (and in those days a goldsmith was really an artist, as I have already said) who excelled in any particular branch of Art he determined to excel him. Thus it was that he grew to rival the medals of one, the enamels of another, the peculiar manner of putting foil to precious stone of another, and in fact, there was not a branch of Art which he did not consider it his duty to excel in. With this spirit, is it wonderful that men of really great taste should have been produced, men who, you observe, looked upon every branch of productive art as really a branch of the highest art of design; and thus in their own persons combined that art with the power of the tool?

There is another celebrated jeweller of that time, whom he mentions frequently, of the name of Antonio Foppa, a Milanese, who is better known in the history of Art by a name which he received in derision in Spain, the name of Capodursa, which means a bear's face, and which he is known

by commonly in works of art. Cellini describes to us the processes by which he produces his works, and they are so careful, and require such accurate knowledge of Art, that his knowledge must have been very superior indeed in the arts of design. As an instance of what was the latitude and the extent of Art, and how really a jeweller or goldsmith in those days was not above his work which in our days no one would dare offer to a person of such a profession, we have a case recorded in the history of one of the painters, Pierino del Vaga, by Vasari, speaking of a very particular friend of Pierino's, a goldsmith. When the Grand Duke of Tuscany was building his palace he gave to this man a commission to make the metal blinds for the ground floor of that palace; and it is considered a great pity that a work of so homely a nature should have perished, because there can be no doubt whatever that it was a work of exquisite beauty. So that, even upon what would be considered the lowest stage of common production, the artist did not feel it was beneath him to design—not to give a design to others, but to execute it himself. We have in the collections, particularly of Italy, in the palace, evident proofs of the great extent to which this combination of various arts must have been carried in works exceedingly complicated, extremely beautiful, and at the same time, necessarily requiring a great deal of ability to execute. Those are the rich cabinets in which may be found, mixed together, works in marble, and in ivory, and in wood, and in metals, and in enamel, and in painting, all combined together by one idea, and all executed by one hand, but of the authors of which it seems impossible to find any good trace. They probably were produced by those men called goldsmith, and who, as I said before, could work as well upon any of those substances, and thus bring them harmoniously to form one beautiful whole. (Cheers).

Now, proceeding from what is most precious in art to what is more homely, let us return for a moment to a subject on which I have already touched. I have spoken of the beauty of the productions of antiquity in metal, which were found in the excavations, particularly of those two buried museums, as we may call them, of antiquity,

Pompeii and Herculaneum. The collection of these is chiefly in Naples. Except where presents have been made to other countries, they have been jealously kept together. Now, these different objects have not been dug out of temples or out of palaces, but they have been taken out of every sort of house—houses evidently belonging to the citizens—and I think you may see that there is not one in that collection which does not immediately arrest the eye both by the beauty of form, and by its exquisite fancy. Many of them have been engraved in the publication called the Museo Borbonico, the Bourbon Museum, of Naples; and I think very justly the remark is made by the editor in the fifth volume, that the whole modern civilized world, however vast it may be, and however it may labor, in so many arts and so many trades, does not and cannot exhibit even a small proportion of that elegance and ornament varied in a thousand ways, and in innumerable most fantastic modes, which are to be admired in the remains of furniture found in Pompeii and Herculaneum—two cities which occupied so insignificant a place in the ancient world. That is quite true. Now, what are we to infer from this? There can be no doubt, as I have said, on examining these beautiful objects, that they have been for common use. There are scales—steel-yards—which can only have been made to weigh provisions; the chains are most delicately worked; the weight is frequently a head with a helmet, most beautifully chiselled; and so genuine and true are these, so really intended for every-day use that one of them has stamped upon it as yet the authentication made at the capitol of the weights being just. This was a steel-yard which was in the kitchen, and it was for the other large vessels which must have served for culinary purposes, and of which the handles, and the rings, and the different parts are finished far beyond what the finest bronzes that are made now in Paris can equal. What are we to conclude? You do not suppose these were the designs of the Flaxmans and the Baileys of that day. Who ever heard of a great artist in Pompeii and Herculaneum? And how can you imagine that every house furnished itself with what were considered exquisite and extraordinary specimens of Art, for

the use of their everyday life? And then, where are their common utensils, if these are not they? If these lamps were not what they burnt, if these candelabra were not the shafts upon which they prepared their viands, where are those? Were they carried away in the flight? But the most precious would surely be carried away, and the commoner be left behind. Nothing of the sort. One may see here everything is to be found; everything is beautiful in shape, and generally in finish. What are we to conclude? Why, that the braziers who made these things were able to make them. They came from the hands of the brassfounder; they have been chiselled in the workshop; they have been finished, not to put up in cabinets, but in order to be knocked about by servants. Then we have a state of Art in which the producer, the man who makes, who manipulates, who handles the object of manufactures which he produces, was able to do what now defies almost our most superior workmen. (Cheers.)

Now, let us go to another part of the world, and come to a later period. Nuremberg, during the time which I have specified—between 1300 and the middle of 1500—was a centre of Art, and especially in all metal work. There is an observation of Hoffman, a German writer, that Nuremberg was the city in which the artist and the craftsman walked most harmoniously hand in hand; but I think he does not go far enough; he ought to have said that it was a city in which the artisan and the artist were the most perfectly combined. At a very early period—that is, as early as 1355—there was produced a piece of work such as is at this day the admiration of all artists. And what was it? It was a mere well—a fountain in the public square; the beautiful fountain—the beautiful well, as it is to this day most justly called. Now, this was made entirely by the designer—by the artist himself, Hofer, who united in himself these two qualities; and it is acknowledged though perhaps somewhat in his temper not amiable, yet sternly honest in all his dealings, he seems to have been the great centre, around which the Art of his period revolved. There was no one so great, so sublime in any particular branch of it that did not look up to Michael Angelo,

and consider him his superior. It is acknowledged that Raffaele went into the Sistine Chapel, and saw Angelo's wonderful works, and changed entirely his style upon beholding them; and it is particularly acknowledged by the writers of that time that in every other department he was considered equally superior. Now, you would suppose that this man, upon whom commissions poured in every day for great works, would have employed a number of artisans to assist him; that he would have had carefully prepared models, which he would have entrusted to skillful artificers, so as to lighten his labor; but no such thing. There is every evidence we can desire that from the beginning to the end, Michael Angelo performed the whole of his own work; that he began with the piece of marble as it came from the quarry; that, if not always, pretty generally, he did not even condescend to make a design, or beyond a small wax model, but immediately set to work with chisel and mallet on the figure which he had in his imagination, and which he knew was as truly lurking in the inanimate block. Vasari shows us, in fact, from his unfinished pieces, in what way he must have mapped out the marble and done the work himself; and that is why we have so many vast pieces by him unfinished; either the stroke did not come out as he desired, or it went too far into the marble, and spoilt his labor. But so it is, that by far the greater part of those gigantic pieces which he finished, if not all, were the productions of his own hand, as well as of his own intellect.

When about seventy-five years of age, Vasari tells us, he used to be just as indefatigable with his chisel and hammer as when he was a stout young man; he had near his bedroom, if not in it (for he lived in a most primitive and simple manner,) an immense block of marble, and when he had nothing else to do he used to be hammering at that, and when asked why he so continually worked at this branch of his Arts he used to reply that he did it for amusement to pass his time, and that it was good for his health to take exercise with the mallet. He undertook at that age, out of an enormous block of marble, to bring out four figures larger than life, representing the descent from the cross; and he had nearly worked out the figure of Our

Lord when, happening to meet with a vein that was hard and troublesome, he one day broke it into half a dozen pieces. It was seen in this state by a friend, and his servant begged it for him. It was put together, and it is now to be seen at Florence. But Vasari says that it was necessary, in order to give him occupation, to get another large block of marble and put it near his bed, that so he might continue at his work, and he began another group of the same sort. This was at the age of 75. And Vasari gives us an interesting account of how he worked: he says he was remarkably sober, and while performing his greatest works, such as the paintings, he rarely took more than a crust of bread and a glass of wine for his dinner. This sobriety, he says, made him very vigilant, and not requiring much sleep; and very often in the night he used to rise when he could not sleep, and then he worked away with his chisel, having made for himself a sort of helmet or cap, out of pasteboard, and upon the middle of this, in the top, he had his candle, so that the shadow of his body never could be thrown upon the work.

Apropos of this, Vasari tells us an anecdote which is interesting, as showing the character of Michael Angelo and of his time. Vasari observes that he never used wax candles for this purpose, but a particular sort of candles made of goat's tallow, which, he says, are particularly excellent. Wishing to make him a present, he (Vasari) sent to Michael Angelo his servant one day with four bags of these particular candles, containing 40lbs. of them. The servant brought them, and Michael Angelo, who never accepted a present, told him to take them back again; he would not receive them. The servant said, "They have nearly broken my arm in bringing them; and I shall not carry them back." "Then do what you like with them," said Michael Angelo. "Then," replied the servant, "I observed, as I came to your house, that just before your door there was a nice bed of just hardened mud; I'll go and stick all the candles in this, and light them all, and leave them there." Michael Angelo said, "No, I can't allow you to make such a confusion as there would be about my door; so you may leave them." This shows the homely and friend-

ly way in which the artists lived among themselves. (Cheers.)

Now, we have a very interesting account of the manner in which he used to work at this marble, from a contemporary French writer, who says: "I can say that I have seen Michael Angelo when he was about sixty years of age, and not then very robust, make the fragments of marble fly about at such a rate that he cut off more in a quarter of an hour than three strong young men could have done in an hour, a thing almost incredible to any one who has not seen it; and he used to work with such an impetus, that it was feared he would have dashed the whole marble to pieces, making at each stroke chips of three or four fingers's thick fly off into the air;" and that with a material in which, if he had gone only a hair's breadth too far, he would have totally destroyed the work, which could not be restored like plaster or clay.

Going now to another part of the world for the same Art, we return to Nuremberg, and find a most magnificent piece of sculpture in stone, unrivalled in the delicacy and exquisite beauty of the work; that is the tabernacle in the Church of Saint Lawrence. It rises from the ground and goes up, not merely to the top of a very high church, running along like a plant, with one of the pillars against which it is built; but, as if the church was not high enough for it, creeping far beyond, and making the most graceful termination, which has nothing similar in works of this sort. So beautiful and delicate is the whole work, that in the treatment of the metal work and in the beauty of the religious images which surround this fountain, but few steps have been made in Art since that time. And he, as I observed, was a mere workman; he did his own work. At a later period—at what is considered the third period of Art, in Nuremberg—there is another remarkable piece of metal work; and I am glad to find that in the last report just published by the department of Practical Art, Mr. Smirke has introduced a letter, in which he begs that this piece of workmanship, which he calls one of the most celebrated productions in metal, may be copied by casts, and brought to this country as a specimen of Art. Now that

beautiful production was of as early a period as 1506; it was made between 1506 and 1519; and it is the shrine of St. Sebald, in his church at Nuremberg; and no one who had seen that exquisite piece of work—so beautiful, so elegant, as that no iconoclasm had dared to touch it, though I must say that Nuremberg had been preserved from the reproach of that error—but there it is in its freshness and its beauty, as it came from the artist's hand; in the centre, a shrine of silver, in which is yet the body of the Saint, around it what may be called a cage or grating of the most perfect metal work, and with statues of most exquisite workmanship. Now I do wish this to be brought to England—a copy, that is, of it—not merely because it will show what was done in ages that we consider hardly emerging from barbarism—not only what beautiful inspirations religion could give the artist, but because it will show to those who are trying to raise the character of any art the true principle upon which alone it can ever be raised to what it was then. They will see artist portrayed upon it—Peter Vischer—they will see him with his chisel and his mallet in his hand; they will see that he aspires to nothing more than a handicraftsman, a workman in metal, who yet could conceive first and then design this most magnificent production of man's hand. (Applause).

Another example, something of the same sort, we shall find in a neighboring country. There is at Antwerp, likewise, a beautiful well near the cathedral; and if you ask who it was one who sometimes had been known as a painter, and at others under the more familiar appellation of the blacksmith of Antwerp—a blacksmith—and there is a piece of iron work, which I fear, that not our most perfect works could turn out; certainly not—nothing that could be compared with it; and Quintin Matsys was a poor schoolboy, who, finding the heavy blacksmith's work too much for him, took to drawing and coloring little images of Saints to be given out in processions, and thus rose to be a painter and an artist, finding his first profession too heavy for his strength. But this iron work is a work of Art; it is not a work merely cast in the lump, and then put together; but it is a work that required genius, that required great artistic skill; it shows that

artists even worked in iron; that a man who belonged to the very lowest branch of what may be considered the Arts—laboring in metal—was able, notwithstanding, to imagine and to carry out the most beautiful conceptions.

Now coming to modern times, do we find anything of this sort? I content myself with referring to that report which I have just mentioned—of the department of Practical Art. In that report there are incorporated letters from some of our best silver and goldsmiths, upon the character of the artistic proficiency of the workmen; I only read one, for all in reality repeat the same sentiment. “At present we seldom find an English workman who understands drawing. Not one of our English workmen has a knowledge of drawing;” and it said that, without exception, these men will not even go to the school; they have attempted to bring them to the School of Practical Art, that they may learn something of the principles by which the works in their branch of productive art should be conducted. They cannot induce them even to go and obtain that information, though it is nearly, or entirely, gratuitously given. So little taste, then, so little feeling of Art, is there in our workmen now. Can we expect they will produce works that will rival those of the ancient times? For there is that broad, immense difference; in one the artist was the workman; now, the workman has only a degree of intelligence above the machinery which he uses. He can apply those means which are put into his hand, but can have no feeling to ordinary perfection. On the other hand, we must be struck with the difference, that in France there is much more taste, much more knowledge, much more intelligence in the actual artificer; the exhibition showed that, though we had magnificent things in silver work, and gorgeous objects in metallic productions, beautiful and splendid, yet when you came to look at them with the artist's eye, you could not help observing the immense difference between our English productions and those of France; though, be it spoken to the glory of our English goldsmiths, they have both the taste, and the generosity, and the munificence to bring over and to employ the very first foreign artists; and it was thus we did produce some objects

that stood in competition, not with those of the workman's rivals, but with those of his own countrymen.

In V. eht you had an example of what the artists in old times were. He began as a cotton-spinner; he became a manufacturer of toys; then a button-maker; and then he began to work with the chisel. His genius developed itself. He began to retouch and repair ancient armor, and then was tempted, seeing that these were things sought after (it appears with the most honest intention) to imitate them, and he found that they were bought and put in royal and imperial cabinets as real works of what is called cinquecento. And then he imitated the shields, working exactly upon Cellini's principle, that everything, however small, is worked out separately, and then fastened together; that nothing is cast, but that everything, to the smallest tip of the least finger, is hollow; and he worked on, and produced it by his artistic and careful manipulation. He began to work this way, and he found his silver work also became considered as ancient and adopted into collections of valuable antiquities. He then learned the power of his own genius, and he soon rose; and when the late revolution in France took place he had commissions for works to the amount 60,000*l*. And this was all his own work, the production of his own hands. However, his losses were in common with many others who had engaged in higher branches of art, and he has been engaged in higher branches of art, and he has been since in this country; but certainly those specimens of his work which we had in the exhibition were not only most beautiful but most exquisite; and many persons who took pains to examine in detail some of his works in silver, which were presented by one French house in particular—the Freres Maurice—must have been struck by the high artistic merit of them all. And they are all worked entirely bit by bit by the artist; and it was impossible they could be executed but by an artist who could model as well as draw, and who knew how to treat his metal perfectly, so as to give all the softness, beauty, and delicacy of the original model. (Cheers)

Now, let us proceed to what may be considered a higher branch of Art, and that is Sculpture. We shall find exactly

the same principle go throughout: all the greatest artists of the most flourishing period were men who did their own work. You are probably aware—many, I have no doubt, are—at the present day, when a sculptor has to produce a statue, he first of all makes his model in clay—probably a drawing first, then a small model, then a model exactly as he intends the statue to be full-sized and completely finished; from this the cast is taken in plaster; the block of marble of proper size is put beside it, and a frame over it from which there hang threads with weights; these form the points from which the workman measures, from corresponding lines, first to the models, and then from these which are over the cast to the cast itself; and by means of the merest technical process he gradually cuts away the marble to the shape of his cast, and often brings it so near to the finished work that the artist himself barely spends a few weeks upon it. This was so much the case with a very eminent sculptor, that it is well known he hardly ever had occasion to touch it. Now, that was not the way the ancients worked; they knew perfectly well that there was more feeling in the few touches which the master hand gives, even from the very beginning of the work, than there can be in the low and plodding process of mechanical labor; and we find those who were really exquisite in ancient times were also their own workmen. Vasari tells us of Orcagna, that he made at Florence seven figures, all with his own hand, in marble, which yet exist. Now, Orcagna was certainly a remarkable person. He was a sculptor, a painter, and an artist; and so justly vain, if one may so speak, of this varied character of his Art that upon his monuments of sculptures he calls himself a painter; upon his paintings he always calls himself a sculptor: his paintings are to be found in the cemetery at Pisa. The most beautiful and splendid of his works is the matchless altar in the Church of San Michaeli, in Florence, of which, I am glad to say, there will be an exact copy, now, whose work is certainly most beautiful, most finished, as far as we can gather from his life, actually did the work with his own hands, and carved the whole of the marble himself.

I shall have occasion to speak of another celebrated artist under another head, and

therefore I will mention one who became very celebrated, and from whose life it is evident that he did the whole of the carving with his own hands, and that is Brunelleschi. He lived at the period when Art was truly becoming most beautiful—the period which just preceded the appearance, perhaps of a still greater artist, but who in some respects, departed from the purest principles of art. He was the contemporary of Donatello, and they were both very great friends, and worked even in the same church. An anecdote related by Vasari, in the life of Donatello, will show us how truly Brunelleschi was not merely a sculptor, but a carver, who performed the work with his own hand. He tells us that Donatello had received a commission to carve a crucifix, which yet exists in the Church of Santa Croce, under a beautiful painting by Taddeo Gaddi, and that he produced what was considered a very fine work, but he was anxious that his friend Brunelleschi should see and approve of it. He invited him, there, one day to inspect it, which shows that the work had been covered up and concealed during the execution. Brunelleschi looked at it and said nothing. His friend Donatello felt hurt. He said —“I have brought you here to give me your opinion; tell me candidly what do you think of it?” “Well, then,” Brunelleschi said, “I will tell you at once, that is a figure, not of Christ, but of a peasant or a rustic. Donatello was indignant. It was perhaps the most beautiful specimen of the subject in carving which had been produced; and he used an expression which became a proverb, and I cannot help remarking how many expressions of artists have turned into proverbs. The expression in Italian means this —“Take you a piece of wood and make another.” Brunelleschi did not reply. He went home. He did take a piece of wood. He said nothing to Donatello, and he carved his crucifix. When it was quite finished he met Donatello, and said, “Will you come and sup with me this evening?” Now, I narrate this anecdote partly because it shows us what the great artists were—that they were not great gentlemen living in any particular style. (Applause.) “I will do so with pleasure,” said Donatello. “Then come along;” and Brunelleschi, as they went, stopped at the market, bought eggs

and cheese for their supper, put them in an apron, and said to Donatello, “Now, you carry these to my house while I buy something else, and I’ll follow you.” Donatello entered the room, saw the crucifix, let fall his apron, and smashed his eggs. (Laughter and cheers.) Brunelleschi soon followed, and found Donatello with his hands stretched out and his mouth open, looking at this wonderful work. “Come,” said he to Donatello, “where’s our supper,” “I have had my supper,” said he; “you get what you can out of what is left.” And then, like a noble hearted, generous artist, he took his friend by the hand, and said, “You are made to represent Christ; I only to represent peasants.” (Cheers). Now, this shows as I said before, that this poor artist carried on his own work with his own hands, shut up in his own house; in fact, that as Vasari tells us, he never allowed any one to see it until it was quite completed.

There can be no doubt that among all the names celebrated in Art, there is not one that can be put in comparison with that of Michael Angelo; a man who, not merely from his follower, disciple, and intimate, Vasari, but even from jealous, and envious, and ill-tempered Benvenuto Cellini, receives constantly the epithet of “the divine.” No man certainly ever had such a wonderful soul for Art, in every department—the cupola of St. Peter, as an architect; his Moses and his Christ, as a sculptor; and his Last Judgment, on the ceiling of the Sistine Chapel, as a painter, are three monuments which would have made the eternal fame, not of three, but of a hundred artists in each department. (Applause.) Great, noble, generous, and representing all the mysteries of Our Lord’s Life and Passion, that for a long time, people used to assert that it was not stone, but modelled in some composition. But it has been proved beyond doubt that it is stone. Now, the man who made this was a mason—a common working stone-mason—Adam Kraft, who built part of the tower of the church, and whose name is upon it as the mason who built it; and he until 1490, when he was 53 years of age, had never attempted to work as a sculptor; and yet before he died he had not only executed many beautiful works, and among them a carved staircase in the tower, but

his exquisite work, which is without a parallel. He has represented the whole of it as supported by three kneeling figures, himself and his two apprentices, who executed alone the whole work.

We see, therefore, that wherever there has really been grand or noble work executed in statuary by sculptors they have been artificers as well as designers; they have done the work with their own hands, as well as imagined it in their own fancies. (Cheers).

Let us go now to another department of Art. We have treated of metals and carved work in wood and stone. Let us go now to pottery. I have already observed that those beautiful vases known by the name of Etruscan, were really made, originally, for domestic use; that, consequently, they were made by the potter, and not by a fine artist only—this has been fully proved. It used to be thought at one time they were all funereal, or of symbolical use, being found almost entirely in tombs; but it has been proved that the greater part of them were for the common domestic purposes of the table and the household—that some, indeed, were given as prizes at the games, filled with oil; others were marriage presents, kept with more care in houses; but still they were the work of the potter, and must have been produced entirely by hand. This was so much considered as a branch of Art that, in early Rome, in the time of Numa, there was a College of Potters—they were ennobled by being made a special guild. Any one who went through the Exhibition must have been particularly struck with the elegance of forms which prevailed in all the Indian, and also in the Turkish pottery; and the common vessels, used to carry water on the head by the peasantry of Italy and Spain, have the same elegance of form which very little of our china, or of our finest pottery, can exhibit; and the question naturally suggests itself—how is this, that in many other countries there should be such beautiful productions, and at the same time that we should not be able to give the same beauty of form? The answer to this is given, I think, very correctly by Mr. Digby Wyatt, in his beautiful work on the late Exhibition. He observes, that “there can be no doubt that the reason of this beauty in the old pottery and

in that of the East is, that it is made entirely by the workman himself. There can be little doubt that the most beautiful forms of Greek and Etruscan vases have been generated by a simple process of formation, and by the refined delicacy of touch, acquired by the potter during years of practice. The perfect outline of some of the commonest objects of pottery from India, Tunis, Turkey, and the rest, demonstrates the methods by which contours, equal in grace to the Etrurian and those of Magna Græcia, have been produced. In the finer work of pottery, among us, a distinct person is employed to design from him who makes the object; the one makes the pattern, and a mould is probably made of the same figure as is given. But in the ancient and Oriental objects the beauty of form is attributed to the Art being literally in the potter’s fingers; and he acquires by the manipulation a fineness of touch, a delicacy of eye, which enables him to produce beautiful forms, which no one in the abstract could imagine.” This is corroborated by the fact that in the British Museum, in the great gallery where the Etruscan vases are kept, you will not find two—and if you search the Vatican and Bourbon Museum, and all the collections in Europe, you will not find two, perfectly alike; there is a difference in them, which shows they were not produced by a model, but simply out of the hand; and I have no doubt that the influence of this working in clay is to be traced in all the works in metal and in glass of the ancients—because, no doubt, the eye of the man who worked in bronze had been formed by his familiarity with the beautiful patterns which came forth every day from the hands of the workmen in clay. I find, too, it is mentioned in Pliny that when a knight named Octavius, in the time of Augustus, wished to have a vase made, it cost him a talent, or upwards of 50*l.* to have the model made; which shows that the clay model was to be moulded before the marble vase was sculptured. In this Art, then, the producer is the designer, the artist is the artisan, and hence comes perfect beauty.

Next to this must be mentioned a very important branch of Productive Art in which the Art of design is always necessary to be in combination with the actual manufacture; and that is china, or painting up-

on pottery. The Etruscan vases are often simple, sometimes of one color, sometimes they have nothing but ornament; at other times they have most beautifully executed, though sketchy, scenes of ancient mythology, or very frequently from the *Iliad*. These are done in a way which shows that there must have been hundreds of artists who could do that work. Very frequently it was not a painter who did them, but the man who was at work on the pottery throughout; and although mere sketches, they are considered as containing the elements of very beautiful drawing. If we come to speak of Art in modern times, a remarkable instance of genius persevering in its work may be taken from the history of Bernard Palissy. He was an artist, but as a painter of comparatively humble pretensions, for he tells us he used to paint figures, images, and so on; but in this he was an artist, to a certain extent. He tells us himself, in the biography he has written, that in 1544, when there seemed not to have been anything approaching to ornamental pottery in France, he happened to see an Italian cup, which struck him as being very beautiful; and he thought to himself—"Why could not this be produced in France?" He set to work. He was a poor man, hardly educated; but he had a great turn for chemistry, and was particularly desirous of finding out a manner of enamelling pottery, and especially a white enamel, which he at length contrived to make. He took his work to be baked in glass-houses, and found it completely fail; then he set to work in his own house, and he built a furnace for the purpose. He put his ingredients into the furnace; they would not set or harden. He had spent all his money, and he gradually pawned all his clothes, and burnt every article of furniture to keep up the furnace, and pulled up the fruit trees in his garden, and then the very floor of the house, to keep up the fire. Still the work was all spoiled. When he went out, the people charged him with being a coiner; he was ridiculed as mad, and every sort of annoyance came on him. He persevered yet; and having found that his furnace would not act, he pulled it down, and with his own hands bringing the lime and bricks, he built another furnace, and then sat for six days and nights watching the fire. Then he began to succeed;

he got a little money, by having a commission to make a survey, and came back to his work, and tried again. The mortar he used, however, happened to have some poison in it; and just as the pottery was going to set, he heard a crack, and the pebbles in the mortar began to fly, and broke his enamel. He set to work again, and put his materials again in the fire, and this time there was a tremendous explosion, and the ashes burst in; and the whole of his work was covered with black, so firmly set into the enamel, that it had to be thrown away except a few pieces, by which he made a trifle. For sixteen years he persevered in this way; and then was crowned with success, and produced the first specimens of colored and beautiful pottery, such as are to this day sought by the curious; and he received a situation in the king's household, and ended his days in comfort and respectability. (Cheers.)

I could mention the beautiful earthenware of the sixteenth century, known by the name of Raphael's ware, because it is supposed that Raphael himself did not disdain to make designs for common pottery not to be used merely by the rich, but to be found in the common cottages, and houses of ordinary classes; the most beautiful specimens being in the apothecaries' shops of Padua and Verona. There we have the employment of high art in the decoration of a common and ordinary object; for the pottery itself has no particular pretensions to elegance of make; but yet one of these plates, thick, heavy, clumsy, and coarse as they are, is worth a service of modern production.

Another department is statuary in pottery, which presents some very interesting features in the history of Art. Its very origin is exceedingly interesting. Pliny gives it to us as the invention of a certain potter, whose daughter, when parting with a youth to whom she was engaged, did what I dare say most of you have often done—made him stand before the lamp, so as to throw his shadow on the wall, and so sketched his head and face; and the father, wishing to preserve this sketch, took some of his clay and filled up the outline, and made a bas relief of the countenance. That piece of pottery, at the time when the Romans first became acquainted with Art, and carried away the monuments of

Greece, was preserved in the Temple of the Nymphs, at Corinth, as a treasure of Art—as the first germ from which had been developed some of the most beautiful productions of that kind. (Cheers.) By the time of the Roman kings of the race of Tarquin, the inhabitants of Italy had arrived at such perfection in this art that they used to make chariots, horses, and other representations of clay, so well baked that they could be placed in the open air, and stood for many centuries without injury; and in fact, we find them now among the Etruscan monuments. The Romans must also have learned well how to paint them; because we find it stated that there was an artist, whom Varro particularly mentions, who imitated fruit in pottery so perfectly as to deceive any one, and make one think it was real.

But the most interesting example of this application of high Arts to such products is what we find in the life of an eminent artist, and at the same time a potter, Luca della Robbia. He was put, when quite a boy, apprentice to a jeweller; he very soon began to make things in bronze; he gave up mere small modelling, and began upon marble, and succeeded very well. He worked the whole of the day at his chiselling, and sat up all the night drawing. He was poor; he was hungry and cold, and the only means he had of warming himself at night was to put his feet in a basket of shavings, while he sat there drawing, and would not be driven from it. Now, there was an education for him—beginning first with small work and exercising his patience and skill in that way. (Cheers). Sigismund Malatesta, the great patron of Art at Rimini, was then building a splendid church, and he sent to Florence to find workmen to do the carving; and Luca della Robbia was engaged for this purpose. He had at that time been a silversmith's apprentice, had executed works in marble and bronze, and was set to undertake that noble work at Rimini; and how old was he when Sigismund engaged him? He was *fifteen*; and what pains and study must have been gone through in that time by the poor boy to make himself really an artist! He succeeded admirably at Rimini, and came back and received a commission to work with Donatello, to make a screen for an organ, and a bronze

door. After all this, he suddenly discovered a totally new branch of Art—modelling in pottery. He first contrived to manufacture his own clay; he then discovered a mode of glazing it to such a perfection, that centuries of weather do not in the least affect it. He then contrived to color it in the most beautiful manner; and all Florence, and every part of Italy, may be said to be filled with works of Art equal to anything produced in marble, and valued as high. He then went on improving his art; he began, then, tessellated pavements and outsides of churches, which are most beautiful; and then, taking to himself not a number of workmen, to mould under him, but two near relatives of his, who were artists and sculptors in marble, to come to work in clay, this family carried on the same work to the third generation, when the secret of the art expired with the family. But in those three generations, till Pope Leo gave them the commission of making the pavement of the Loggia of Raffaele this family made an infinite number of original works of Art, executed by hand, colored and baked by themselves. Now, there is a whole family of artists, in whom the productive and the artistic skill were united. In our estimation we should say, what a descent that was, for a sculptor in bronze, in marble, to come to a mere potter! But I will read to you Vasari's sentiments on that subject, who, as the great biographer of Artists, and who lived among artists, and was himself an artist, may be allowed to have a right sentiment upon it. He says: "Luke, therefore, passing from one sort of work to another, from marble to bronze, and from bronze to clay, did so, not from any idleness, nor from being like many others capricious, unstable, and discontented with his Art, but because he felt himself drawn to new pursuits, and to an Art requiring less labor and time, and rendering him more gain; hence the world, and the Arts of design, became enriched with an Art, new, useful, and most beautiful; and he, with glory and praise, immortal and unailing."

We are told by Pliny, that it was in the time of Augustus the practice was introduced of painting the walls of houses. Temples were undoubtedly painted before, because he tells us that when the Temple of Ceres was falling into ruins, the paintings of De-

mophilus were cut away from the walls, as is sometimes done with frescoes, and put into frames in order to preserve them. On one occasion, by the way, the city of Rhodes was saved when Demetrius besieged it, because he feared a beautiful painting would be destroyed that was on the wall of one of the buildings. This painting of walls corresponds to our paper hangings; what we do by putting on stained or colored paper, they did with the brush and the skill of the artist. The walls of Pompeii and Herculaneum are covered with most beautiful paintings, not merely ornamental patterns and arabesques; but there is such a mixture of the mere ornament, and of figures perfectly designed and colored, as to show that there was no distinction made then between the painter of a fresco and the house decorator; the artist was himself the performer of the work, and so beautiful is it, that we have hardly anything in modern times superior to what is commonly found on the walls of the private houses of cities which were in a province remote from the capital, and which had no

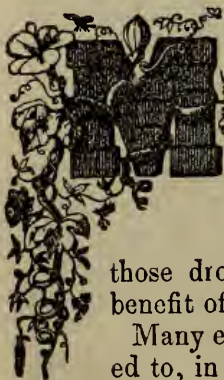
particular recommendation, that we know of, as seats of Art.

We have an instance, also in modern times. Perhaps one of the most beautiful productions of modern Art is the painting of that gallery to which I alluded, where we see that Raffaele undertakes to do what now no one would ever think of committing to the hands of any one higher than a common house-decorator. No nobleman, nor even a monarch, would think of asking the first artist of the kingdom to design the ornament of a gallery, scroll work and grotesques, or mechanical ornament, which, now, would be done by a common process or a common hand. But, in a former age, there was no distinction made between what we now consider the higher and the lower sorts of Art; but the whole of Art was regarded as *one* thing; the greatest of artist considered it was his place to make even the smallest work, which might be insignificant in itself, great and noble, and to stamp the highest impress of Art on the commonest and most ordinary commissions that were given to him.

COMMUNICATIONS.

SKY LIGHT.

Louisville, Sept. 24th, 1853.



R. SNELLING.—Sir, having passed through the many trials and tribulations, which ever attend a leaky-light, we propose to give the worthy Brothers, who may still be sitting under the drippings of those dropsical rainy-day pets, the benefit of our experience.

Many expedients have been resorted to, in the vain endeavor, to overcome the evil; but none have been entirely successful, and, indeed, we have yet to see the sky light, which is not a perfect nuisance in a stormy day, it matters not how "steep" your light or how glass is

cut, or how the sash is glazed, partial success is all you can claim, CAPILLARY ATTRACTION is your enemy, (dip one end of a sponge into a basin of water and you will have a practical illustration of the process, for the whole will soon be saturated) you may stop his breath, and "get him down" for a while by filling every little crevice with paint or putty, but the expansion and contraction of the glass, by heat and cold, soon loosens the paint and putty, from the glass and the leak is about as bad as ever.

Now gentlemen, all who have *no* sky-lights, and *all* who have such as *they* are perfectly satisfied with, may just hold their peace, but if any poor D—l has got caught out in a shower, under a leaky sky-light without an umbrella, we would like him to read the following, which will explain the whole phenomena.

Our light is about twelve feet square and lies flat upon a shingled roof, (not a very steep one,) and it was about as *moist* as sky-lights "get to be," until within about one year and a-half, we tried the virtues of paint and putty to our heart's content, to say nothing about the other experiments, but all to no purpose; we finally watched the operation and found that when the glass got wet a portion of the water was drawn up between the two smooth surfaces of glass (at the top) until it reached the upper *edge* of the *under pane* which it followed until it reached the rib, or sash, down which it took its course until it found a convenient place from which to "drop" into the room, and leave the way clear for an army of followers. *Each pane of glass does the same thing, not one drop in one hundred will fall directly from the glass.*

Now sir, if you will attach a small gutter to the under side of each rib, allowing the same to project about one-eighth or three-sixteenths of an inch beyond the edge of the rib (on each side) and running the same the entire length of the rib, the water will be conducted to the lower side of your light, when a larger gutter running cross-wise will receive the water from each rib and conduct it off to one side into a bucket or through a pipe out door.

Persons who doubt the virtues of the above remedy are assured that we have *caught seven pails full* of water in as many hours in the very way we propose; we have two sky-lights and not one pint of

water has fallen into our gallery in eighteen months.

In building a new light, we would recommend the grooving of the sides of each rib in such a way, as to form a little gutter which will conduct the water immediately out upon the roof.

Yours truly, WEBSTER & BRO.

OUR ILLUSTRATION.

The illustration for this number, is a view of the Fitchburg depot Boston. It is probably one of the finest buildings to be found in this country, devoted to such a purpose. It is built of rough quincy granite, at a cost of \$100,000. It is 316 feet in length, 80 in breadth; the towers are 90 feet high, and serve as entrances to the hall, in the upper part. This hall extends over the whole of the building, with the exception of a few offices on each side of one end, but leaving a passage half the width of the hall; this is probably the largest hall in Boston, though not well adapted to musical purposes, it is sometimes used for concerts. Jenny Lind sung there several times with good success; but there are few singers of sufficient capability to fill the hall. The first story is used for the accommodation of passengers, refreshment and sitting rooms, ticket offices, &c., which are all got up in excellent taste, the inside being in perfect keeping with the outside architecture of the building.

J. A. WHIPPLE.

NAPHTHA.—A compound of six parts carbon with six of hydrogen. It exists native in many parts of the world, under the name of mineral naphtha, rock oil, and petroleum. It may be obtained by distillation from coal-tar, and may be purified by re-distillation, mixed with a little sulphuric acid. It is liquid at common temperatures; requires nine parts of oxygen for its combustion, and unites with ether, alcohol, and oils. It has an unpleasant odor, dissolves caoutchouc and gutta-percha, but does not

combine with water. It is used in the daguerriaen process in combination with sulphuric ether, to clean the plate, as follows:—Take 4 oz. naphtha, to which add 40 drops sulphuric ether, shake them well together, and cork up tight. When wanted for use put a few drops of the compound into 1 oz. of alcohol, shake them well together, and use in the same manner as alcohol and ammonia, as described for cleaning the plate.

DRESS—AS A FINE ART.

BY MRS. MERRIFIELD.

PART VI.—REMARKS ON PARTICULAR COSTUMES.



WE must now offer a few brief remarks upon certain costumes which appear to us most worthy of our attention and study, for their general elegance and adaptation to the figure. Of the modern Greek we have already spoken. The style of dress which has been immortalised by the pencil of Vandyck is considered among the most elegant that has ever prevailed in this country. It is not, however, faultless. The row of small curls round the face, how becoming soever to some persons, is somewhat formal, and although the general arrangement of the hair, which preserves the natural size and shape of the head, is more graceful than that of the time of Sir Joshua Reynolds, we think it would have been more pleasing had it left visible the line which divides the hair from the forehead. With regard to the dress itself: it is apparent, in the first place, that the figures are spoiled by stays; secondly, that the dress is cut too low in front; and thirdly, that the larger sleeves sometimes give too great width in front to the shoulders. These defects are, in some degree counterbalanced by the graceful flow of the ample drapery, and of the large sleeves, which are frequently widest at their lower part, and by gently undulating lines which unites the waist of the dress with the skirt. The Vandyck dress, with voluminous folds, is, however, more appropriate to the inhabitants of palaces, than to the ordinary occupants of this working-day world. The drapery is too wide and flowing for convenience.

Lely's half-dressed figures may be passed over without comment; they are draped, not dressed. Kneller's are more instructive on the subject of costume. The dress of Queen Anne, in Kneller's portrait is graceful and easy. The costume is a kind of transition between the Vandyck and Reynold's styles. The sleeves are smaller

at the shoulder than in the former, and larger at the lower part than in the latter; in fact, they resemble those now worn by the modern Greeks. The dress is cut higher round the bust, and is longer in the waist than the Vandycks, while the undulating line uniting the body and skirt is still preserved. While such good examples were set by the painters—who were not, however, the inventors of the fashions they painted—it is astonishing that these graceful styles of dress should have been superseded in real life by the lofty head-dresses which prevailed during the same period, and long afterwards, and which even the ironical and severe remarks of Addison in the "Spectator" were unable to banish from the circles of fashion. Speaking of the dresses of ladies during the reigns of James II. and William III. Mr. Planché, in his *History of British Costume* (p. 318) says, "The tower or commode was still worn, and the gowns and petticoats flounced and furbelowed, so that every part of the garment was in curl;" and a lady of fashion "looked like one of those animals," says the "Spectator," "which in the country we call a Friesland hen." But in 1711 we find Mr. Addison remarking "The whole sex is now dwarfed and shrunk into a race of beauties that seems almost another species. I remember several ladies who were once nearly seven foot high, that at present want some inches of five. How they came to be thus curtailed, I cannot learn; whether the whole sex be at present under any penance which we know nothing of, or whether they have cast their head-dresses in order to surprise us with something in that kind which shall be entirely new: though I find most are of opinion they are at present like trees lopped and pruned that will certainly sprout up and flourish with greater heads than before."

The costume of the time of Sir Joshua Reynolds, as treated by this great artist, though less splendid, appears to us, with the exception of the head-dress, nearly as graceful, and far more convenient than the

Vandyck dress. It is more modest, more easy, and better adapted to show the true form of the shoulders, while the union of the body of the dress with the skirt is effected in the same graceful manner as in the Vandyck portraits. The material of drapery in the latter is generally silks and satins; of the former, it is frequently muslin, and stuff of a soft texture, which clings more closely to the form. That much of the elegance of both styles of dress is to be attributed to the skill and good taste of the painters, is evident from an examination of portraits by contemporary artists. Much also may be ascribed to the taste of the wearer. There are some people who though habited in the best and richest clothes, never appear well-dressed; their garments, rumpled and untidy, look as if they had pitched them on, like hay, with a fork; while others, whose dress consists of the most homely materials, appear well dressed, from the neatness and taste with which their clothes are arranged.

Many of the costumes of Gainsborough's portraits are elegant and graceful, with the frequent exception of the extravagant head-dress and the high-heeled shoes. The easy and very pleasing figure in the preceding woodcut, after this accomplished artist, is not exempt from the above defects.

In our next illustration, Gainsborough is not so happy. The lady is almost lost in her voluminous and fluttering drapery, and the dishevelled hair and the enormous hat give to the figure much of the appearance of a caricature.

Leaving now the caprices of fashion, we must notice a class of persons who, from a religious motive, have resisted for two hundred years the tyranny of fashion, and until recently have transmitted the same form of dress from mother to daughter for nearly the same period of years. The ladies of the Society of Friends, or as they are usually called, "Quakers," are still distinguished by the simplicity and neatness of their dress—the quiet drabs and browns of which frequently contrast with the richness of the material—and by the absence of all ornament and frippery. Every part of their dress is useful and convenient; it has neither frills nor flounces, nor trimmings to carry the dirt and get shabby before the dress itself; nor wide

sleeves to dip in the plates, and lap up the gravy and sauces, nor artificial flowers, nor bows of ribbons. The dress is long enough for decency, but not so long as to sweep the streets, as many dresses and shawls are daily seen to do. Some few years ago ladies might have been reproached with adhering to the letter, while they rejected the spirit of their code of dress by adhering too literally to the costume handed down to them. The crowns of their caps were formerly made very high and for this reason it was necessary that the crowns of the bonnets should be high enough to admit the cap-crown, hence the particularly ugly and remarkable form of this part of the dress. The crown of the cap has, however, recently been lowered, and the Quaker ladies, with much good sense, have not only modified the form of their bonnets, but also adopted the straw and drawn-silk bonnet in their most simple forms. In the style of their dress also, they occasionally approach so near the fashions generally worn, that they are no longer distinguishable by the singularity of their dress, but by its simplicity and chasteness.

We venture now to devote a few words to the Bloomer costume, although we are aware that this is treading on tender ground, especially as the costume involves a sudden and complete change in the dress. Independently of its merits or demerits, there were several reasons why it did not succeed in this country. In the first place, as we have before observed, it originated in America, and was attempted to be introduced through the middle ranks. In the second place, the change which it endeavored to effect was too sudden. Had the alteration commenced with the higher classes, and the change been effected gradually, its success might possibly have been different. Thirdly, the large hat, so well adapted to the burning sun of America, was unnecessary and remarkable when forming part of the costume of adult ladies in this country, although we have seen that hats quite as large were worn during the time of Gainsborough. Another reason for the ill-success of the Bloomer costume is to be found in the glaring and frequently ill-assorted colors of the prints of it which were exposed in the shopwindows. By many sober-minded persons, the large hat and glaring colors were look-

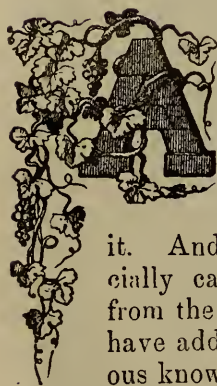
ed upon as integral parts of the costume. The numerous caricatures also, and the injudicious attempts to make it popular by getting up "Bloomer balls," contributed to render the costume ridiculous and unpopular.

Setting aside the hat, the distinguishing characteristics of the costume are the short dress, and a polka jacket fitting the body at the throat and shoulders, and confined at the waist by a silken sash, and the trousers fastened by a band round the ankle, and finished off with a frill. On the score of modesty there can be no objection to the dress, since the whole of the body is covered. On the ground of convenience it recommends itself to those who, having the superintendence of a family, are obliged frequently to run up and down stairs, on which occasions it is always necessary to raise the dress before or behind according to circumstances. The objection to the trousers is not to this article of dress being worn, since that is a general practice, but to their being seen. Yet we suspect few ladies would object on this account to appear at a fancy ball in the Turkish costume.

The disadvantages of the dress are its novelty—for we seldom like a fashion to which we are entirely unaccustomed—and the exposure which it involves of the foot, the shape of which, in this country, is so frequently distorted by wearing tight shoes of a different shape from the foot. The short dress is objectionable in another point of view, because as short petticoats diminish the apparent height of the person, none but those who possess tall and elegant figures will look well in this costume; and appearance is generally suffered to prevail over utility and convenience. If to the Bloomer costume had been added the long underdress of the Greek women, or had the trousers been as full as those worn by the Turkish and East Indian women, the general effect of the dress would have been much more elegant, though perhaps less useful. Setting aside all considerations of fashion, as we do in looking at the fashions which are gone, it was impossible for any persons to deny that the Bloomer costume was by far the most elegant, the most modest, and the most convenient.

THE SUN BEAMS.

Extract from a manuscript volume soon to be published.



As the Sunbeam is the chief instrumentality of the daguerrean artist, it would seem not only proper, but indispensable, that such artist should master whatever is known concerning it. And his attention is more especially called to this subject *now*, from the fact, that recent discoveries have added largely to all our previous knowledge.

It cannot be wondered at that so many heathen nations should numbered the Sun among their divinities. For certainly there is no other *created* object, which images so variously and vividly the un-

created Creator. In truth, not merely the brightness, and beauty, but the very *vitality* of the vegetable, the animal and the human races, depend absolutely on the solar ray. And the fact is demonstrable, that the withdrawal of this ray would speedily be followed by the universal extinction of all material existence.

But, though *we* are better instructed, than to copy antiquity in yielding to the *creature* the homage due to the Creator alone, it is none the less true, that in the solar orb we behold one of the most expressive and glorious of all existing types of that great inscrutable being, from whose fiat the universe sprang. And so infinitely diverse and important are the agencies of

the Sunbeam, in all the spheres of both nature and human art, that some account of its composition and properties may be interesting and perhaps useful to all.

Without going into detail, it may be well to note the principal theories, which have obtained concerning the abstract nature of light.

As by Newton himself, so by his followers, light is regarded as emission of material particles from luminous bodies, corresponding to the aromas issuing from all odorous substances; the former causing the sensation of seeing, as the latter do that of smelling. On the other hand, Young, Frenel, Harris, &c., constitute a school, which maintains, that light is a mere undulation of a subtil~~e~~ ether precisely as sound is an undulation of atmospheric air; the one causing vision by impinging against the visual nerves, as the other does hearing by contact with the auditory nerves.

A theory differing from both these and (so far as I know) peculiar to himself, is advanced by George Field, author of some of the profoundest and most ingenious works yet published on the subject. He considers light the product of two concurrent forces; 1st. oxygen, or the "whitening power," originating in the sun; and 2nd. hydrogen, or the "blackening power," existing either in our atmosphere, or in planetary space. This oxygen darted from the solar orb, impinges against and combines with the ærial hydrogen; thus producing *combustion* with its wonted twofold result, light and heat. Light, therefore, as a *total*, and the several colors, into which it is divided by the various refracting, reflecting and absorbent properties of bodies, are regarded by him as oxydes of hydrogen. He holds, moreover, that magnetism, electricity, galvanism and all other elementary existences are the result of the same two principles, that constitute light. Now it is familiarly known, that the three elements above named are products of chemical action. Field's theory of light differs from others in maintaining the same to be true of *this* also.

"Who shall decide when doctors disagree?"

To the philosophical inquirer, the investigation of the abstract problems may be an interesting pursuit. For the purposes of this treatise, however, their solution would be little worth.

In fact the *practical* philosophy, of to-day ignores this whole class of topics and inquires merely whether the sunbeam be simple or composite, and what are its effects upon vegetable and animal life. To treat cursorarily these two questions will be all I shall here essay.

It has long been known, that the solar beam was not *simple*, but a compound of at least three elements; light, heat, and a third, of which, though some of its effects had been noted, comparatively little was understood. With whatever knowledge existed on this subject were commingled, till recently, a swarm of fables which progressive science has exploded. It is now demonstrated, that in the sunbeam, in its primary state, are combined and equably interdiffused, light, heat, and a third principle, to which has been given the name of "actinism." This name comes from the Greek word, *ΑΚΤΙΣ*,—"Sunbeam,"—and denotes simply "ray power," or "power of the ray." It is not a very felicitous name, since it entirely fails to *discriminate* its subject. For certainly light and heat are "ray-powers" equally with itself. We must, however, make the best of this title for the present.

The precise composition of the sunbeam was discovered by the artificial prism, though nature's own prism, the rainbow, had, for thousands of years foregone, intimated the same knowledge. A beam of *white* light, that is, of light coming *unmodified* from the sun, being made to pass through a peculiarly shaped glass, sustains several interesting changes. First the solar ray, is thus discovered to be not light *simply*, but light in union with the two other principles of heat and actinism.

Secondly it is found, that light itself is soluble into *seven* distinct colors, according to the doctrine of Newton and of most natural philosophers long after him, viz; red, orange, yellow, green, blue, indigo and violet; these colors being of various degrees of refrangibility—the red appearing at the one extremity of the spectrum, as *least* refrangible, and the violet at the other, as *most* refrangible. By certain delicate experimentations, Sir John Herschell discovered two colors *additional* to the original seven; one beyond the violet named by him, "lavender"; the second

beyond the red, and named by him "crimson; or "extreme red."

Sir David Brewster, however, ascertained, by careful experiment, that the "seven colors" of Newton as also the "nine colors" of Herschell, were demonstrably reducible to three, viz. red, yellow, and blue; which *alone* he pronounces undecomposable or primary colors; all the others being readily produced by combinations of these radical three.

But the prism, *besides* thus affecting the *luminous* portion of the solar beam, affects no less its two other components, heat and actinism. At the red extremity of the spectrum it concentrates the main body of the calorific rays, while it gathers the actinic rays at the blue extreme. Thus the bulb of a delicately sensitive thermometer, being held in the blue ray, will stand at 56° F.; in the yellow it will rise to 62° F.; while in the red, or just beyond it, it will rise to 79° F.,—making 23°, difference between the temperature of the blue and the red. It is, moreover, ascertained that the heat-rays are intensest of all *outside* of the red-ray and that the actinic rays act most powerfully *beyond* the blue ray.

These three constituents of the solar beam have each its own special office in carrying forward the innumerable processes of both the inanimate and the living worlds. By reiterated experiments a few of the most important functions of each have been discovered and noted down.

These I will now attempt briefly to describe.

1st. Of light. This, by unanimous recognition, is the sole colorist, and thus the grand beautifier of the visible universe. The azure of the firmamental vault; the green of the meadow, forest and ocean; the gorgeous splendors of the painted clouds; the variously exquisite tints of the flowers, of the plumed and insect tribes, and of the precious gems; and finally, those matchless pencilings, which often make the infantile or female face a lovelier spectacle, than any, and every other the world can display; these, one and all, point to and borrow their chief beauty from the sun's *luminous* rays. This fact is shown by experimentation so simple, that all may put it to the test.

Thus a potato, sprouting in a dark cellar, is seen to shoot up a *pallid* stalk.

But, on a few days's exposure to the sunshine, the *white* stalk takes on a *deep green*.

On the same principle, tropic vegetation wears a tint of green as much more richly dark, than that of the extra-tropic zones, as the degree of sunlight enjoyed by the torrid transcends that, which visits the temperate parallels of our globe.

But while thus imparting color and beauty to the vegetable world, light works out another result, on which the very life of the animal races depends. It has been discovered, that the *green* of all vegetable growths is owing to a substance elaborated in their cellular tissues by the action of light. This substance has been denominated chlorophyll. That light and, neither of the two constituents of the sunbeam, produces this substance, has been determined by numerous facts, of which the following is a specimen. In the warm, moist weather of spring, the sun's *light* is, for successive days, occasionally obscured wholly by clouds, while its calorific and actinic forces are in a free energetic operation. During such intervals, a forest has been known to germinate and put forth its leaves to nigh their full compass, notwithstanding the obscuration of the *luminous* rays. But in such conditions it has been noted, that the leaves, in lieu of exhibiting their *wonted* hue, wore a *pale, blueish white* tinge. A single day, however, of *unobstructed* sunlight has been known to elaborate this coloring, chlorophyll, so rapidly, that, ere its close, the foliage has put on its customary depth of green. This may sound improbable, but it is avouched by the most reliable authorities.

Now, by analysis, chlorophyll has been discovered to be a composite of oxygen gas and carbon. In intimate connexion with its production commences a second most curious and interesting process. This is the generation of the *woody tissue* of the plant, which is found to be effected by the same agency of light. This woody tissue is mostly carbon, and of this carbon the principal portion is derived from the atmosphere. It is quite familiarly known, that carbonic acid—a compound of carbon with oxygen gas,—is one among the constituents of atmospheric air. On this fact is based a beautiful and marvellous arrangement, whereby the animal and the vegeta-

ble worlds are interlinked and made vitally dependant the one on the other. Thus all animals, including man, inhale air, which is a composite mainly of nitrogen and oxygen gases, as a prime indispensable of existence. The lungs decomposed this in breathed air, and its oxygen, uniting with a portion of the superabundant carbon of the blood, generates a species of *combustion*, which supplies the requisite animal heat, while at the same time clarifying the blood. The result of *this* combustion, like that of our fires, burning lamps, &c., is carbonic acid, which passes by respiration from the lungs into the atmosphere.

The amount of oxygen, thus consumed by the countless varieties of animal existence, as well as in other modes, would, but for some replenishing arrangement, in no long time exhaust the atmosphere of this vital element. But by a beautiful *compensatory* appointment, carbonic acid has been ordained to be as literally the "breath of life" to all *vegetable* beings, as oxygen is to animal. Through their leaves, which are their lungs, it is absorbed from the atmosphere decomposed into its two constituents. The carbon goes to form the plants woody fibre, while the disengaged oxygen is dismissed into the atmosphere to replace what had been consumed by animal respiration and otherwise.

Thus it is, that the animal and the vegetable worlds are so inseparably connected and interdependant, that were either annihilated, a swift dissolution would no less befall the other.

What a beautiful anomaly, too, seems

the fact, the *solid tissues*, of all vegetable growths, whether the granite compactness of the oak and hickory, or the impenetrable hardness of the lignum vitae, are a product of the noiseless agency of light; that soft, delicate substances, (*if substance* we may name it) which, launched in floods from its parent orb, and hurrying earthward with thoughts own speed, impinges against that most exquisitely sensitive of organs, the eye, without causing any other sensations, than those of refreshment and delight!

I have already stated one proof, that these results are wrought by light and not by heat or actinism. I will just allude to one or two more.

Thus a plant, sequestered from light while exposed to the other two elements will indeed grow at its ordinary rate; but *besides* being *white* instead of *green*, as mentioned, it will grow up soft and brittle and will never elaborate its proper *woody fibre*.

Again, it has been ascertained, that with the going down of the sun the plant nearly ceases to decompose the carbonic acid, that constitutes its chief nutriment. Thus it would seem, that night is appointed, as a season of repose, not less for the vegetable, than the animal world, as the day is ordained, as a period of labor for both.

But, Mr. Editor, not to be *too* tedious, I must defer my remaining remarks on this topic to another number.

M. A. Root.

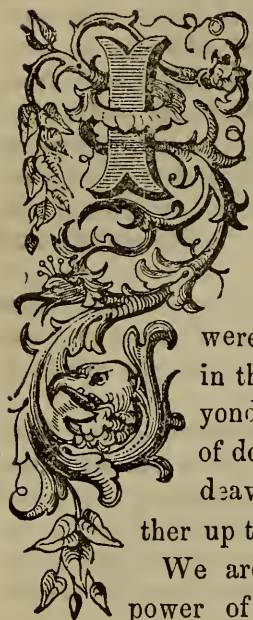
140 Chestnut St. Phila.

Sept. 30, 1853.

LACTURINE.—Lacturine and caseine have been both recommended as media for preparing glass surfaces for the photographic processes. These compounds, which are of a very analogous character, are prepared from butter-milk, by the action of acids. It is proposed they should be used dissolved in ammonia. When this is done, the glass being uniformly

coated by flooding the solution over it, it may be allowed to stand in a warm place, free from dust, to dry: this occupies some time, but if the process has been carefully attended to, the resulting coating is very uniform and clear. Iodide of potassium or of ammonia may be mixed with the caseine solution before it is applied, the other parts of the process being precisely similar to others described in this work.

GOSSIP.



IN a former Number of our Journal, we called attention to the evident want of improvement in the photographic art in this country, and the few members of the profession who were sufficiently interested in their daily vocations, beyond the mere calculation of dollars and cents, to endeavor to raise it a step further up the ladder to perfection.

We are pleased to have the power of acknowledging, that at the present day the state of things is quite different. The change is somewhat for the better. The catchpennies in the business are somewhat fewer, and among those who remain, more deference is paid to the influence of taste. We form this judgment from the fact, that, even among those who at that time, repudiated the idea of further improvement, and the advantage of works and publications devoted to the art, a spirit of inquiry has arisen which must eventually improve their tastes and manipulations, or convince them conclusively of their entire inaptness for the business in which they are engaged, and cause them to seek some other more congenial to their minds and habits.

Most of the class to whom we particularly refer, have not yet arrived at that state of feeling which prompts men to exchange a three or five dollar bill, for that instruction in their art, to be found in the publications devoted to it; but their daily attempts to glean from others who do and from the editors themselves, the truths taught in them, with as little expense to themselves as possible, is somewhat indica-

tive of an acknowledgment, on their part, of their usefulness and of their own necessities, if it does speak nothing in praise of their liberality towards sustaining those who labor to furnish them these invaluable instructions.

Some, however, of this class are not only illiberal in this respect, but are "penny wise, and pound foolish," for we can enumerate several instances in which daguerreans who have refused to subscribe for our Journal "because the *price* was too high," who have paid more than that amount for receipes and directions copied from its pages. This may be a candid way of showing ones contempt for "*book-learning*," but we should say that it is quite as "*expensive as experiments*" if continued. However, we hail the apparent general interest for the further improvement of the Art, evinced by this seeking after reformation—under whatever form it may present itself—with pleasure, and we feel quite confident, if the same spirit continues after the closing of the "World's Fair," that the predictions we have ventured to make, from time to time, will be realised much sooner than we anticipated.

Those who asserted, two years ago, that the Daguerrean Art had attained its highest state of perfection, and could go no further must become dumb upon an examination of the pictures at the "World's Fair," as well as those daily executed by the more, justly, celebrated artists of the east and west. That many of this class have already been convinced of their errors, letters to us are sufficient evidence.

In all these changes we can scarcely flatter ourselves we have had any influence as yet directly; but indirectly we trust we have. Our Journal has been more exten-

sively read and circulated than paid for; those who have read it have, in a large majority of cases, acknowledged the benefits derived from it. Their consequent skill and improvement has effected the pecuniary interests of those who have plodded along in the old beaten track, consequently, although we must attribute the newly awakened interest mainly and directly to the potent dollar, we think the indirect moving powers have been our own, and other works devoted to the interest of Photography.

The lecture of Cardinal Wiseman, which we publish in the present number, contains volumes of instruction, to all connected in any way with art, and is most pertinent to the subject before us. If it is necessary for the artisan to be acquainted with the art of design, how much more so is it for the daguerreotypist and general photographer. We publish this lecture because we know that the photographer is as amenable to its truths as any other class of operatives or artists, and being as necessary to him as the detailed manipulations of his process.

What we have heretofore said, in regard to photography upon paper is rapidly being borne out by the interest it is assuming in the minds of our best daguerrean artists. The exquisite results of foreign artists that are constantly being introduced into this country, tend greatly to opening the eyes of those who are capable of appreciating true art, and we have already Messrs. Whipple, Gurney, Root, Lawrence, Brady, M'Clees & Germon, Fitz Gibbon, Hesler and others, appropriating departments for the practice of portraiture by the various photographic processes, and with a success unparalleled, considering the short time it has engaged their attention. Their specimens show conclusively, that the paper processes are as applicable to portraiture as the daguerrean, and in their hands will as-

sume as prominent a stand in public estimation.

We consider the application of the pantograph to the photographic art, as another decided step towards its advancement to perfection. It would seem, as we progress in the discovery of applications for the photographic art, that every science, art, and mechanical occupation is to be benefitted by its operations. We are assured by eminent philosophers that to photography they are indebted for some of the most important discoveries in the phenomena of nature. Coupled with the microscope it reveals principles of insect and vegetable creation of the most wonderful nature—with the telescope the heaven delivers up its mysteries—mysteries that have long baffled the most intense researches of astronomers; added to the thermometer, barometer and magnetometer, it accurately registers, the slightest changes indicated by them; even the diurnal courses of the sun and moon, and stars, may be indicated by this wonderful art, and their position at different periods of time most accurately registered. Thus we see that of all the arts and sciences given to man, none are of such varied usefulness as that of photography.

Why should it therefore be exclusively or even partially in the hands of the unlearned and the unambitious? It is an art peculiarly adapted to the most refined, the most accomplished, the most learned. It is an art peculiarly adapted to the wants of the people. It is perfectly simple in all its minute details, and most comprehensive, and it is sufficiently important to be embraced in our system of popular education.

The refined, the elegant, the accomplished, and the learned, all study with intense avidity mechanics and the fine arts, and why should they not this most wonderful of all discoveries? Painters affect to

look upon with contempt, yet they would sacrifice everything they possess to be enabled to portray nature with the perfection of photography. Compare a painting of any celebrated ruin, say the Parthenon, by one of the great masters, with a fine photograph, supposing you have never seen the original, and never expecting to see it, wish to study its architecture in all its detail, how inadequate is the former to give a just and comprehensive idea of that once magnificent edifice. As an ornament to the hall or parlor, it is undoubtedly superior and more valuable; but as a precious study of antiquity, it is intrinsically valueless—a mere cipher in the estimation of the studious mind. The photograph, with the aid of a magnifying glass, reveals the whole structure in its minutest details. What are mere patches of brown and white in the painting, in the photograph are perfect fac-similies of exquisite sculpture—every stone, every crack and crevice, every curve and line, every figure, the most minute, every leaf and stem that hangs over the broken fragments of its wall, every effect of time's destroying hand, is as distinctly before you as if you were in presence of the great structure itself. While the painting pleases your taste for the beautiful only, and causes you to admire and praise the exquisite skill of the artist, the photograph fills your mind with wonder and contemplation. The fine specimens of ornamental work, unrevealed by the painting, but conspicuous in the photograph, carries you back to the time when these things were executed, and furnishes you months of interesting study, which gives you an advantage over the mere visitor at this shrine of antiquity, who sees but to remember the more prominent features only. Thus, while the painting gives pleasure only to the eye, the photograph furnishes food for the mind.

The same contrast will hold good in

the landscape, or other views, and in portraits, although not to so great an extent in the last, minute details being of less importance.

Why then should the painter hold in contempt the photographic art? Simply because he does not understand it. The line of art between the painter and the photographer, as may be perceived by our comparison, is distinctly drawn; and it is impossible that they should conflict. To adorn our walls, and please our sense of the beautiful, we apply to the painter; to obtain fac-similies of objects, circumstances and our purses will not permit us to visit, and furnish us with means of studying them, we apply to the photographer—the first is the artist of ideality, the other the artist of reality. Therefore, there is no reason why the painter should look with contempt upon the photographer; but, on the contrary, extend to him the right hand of fellowship, for they can mutually benefit each other.

The results of photography, we know, are at present considered by many artists as contrary, in several respects, to the true principles of art; but “who can paint like nature?” We have no hesitation in saying, that photography is destined to effect a considerable revolution in the present conceived opinion of the principles of art. There are beauties in a photographic picture unapproachable by the pencil of man, but which, considered in the present artistic view, would be pronounced “out of drawing,” and therefore imperfect; but the time may come when these apparent imperfections, looked upon with other eyes and increased knowledge, will be pronounced truly artistic and perfections of drawing. That there are imperfections in photographic drawing will not be denied, but those must ere long vanish before the mighty car of improvement, as they are the faults of manipulation, and not of the

pencil that limns them. The greatest of these faults—the abrupt and broken outlines of the shadows, and the almost extinction of the middle tints in portraits, bids fair to be entirely remedied by the pantograph before alluded to. This instrument, a description of which will be given in our next number, is not only calculated to effect this desirable end, but with it the operator will be enabled not only to enlarge the negative photograph even to the size of life, but the daguerotype also.

In view of all these facts, it is the height of folly in any one to assert the perfection of the daguerrotype, or that “experiments are expensive.” As an advocate for the progressive improvement of the art, we say—no matter what the cost—that experiments are not expensive, if, in three years, they produce one single modification to its improvement. Were we to teach or counsel otherwise, we should justly be considered a mere panderer to the old fogys of the day—a mere catch-penny publisher, wholly intent upon self-interest, and fearful that every dollar spent in experiment, would deduct one from our subscription list.

Would our daguerotypists advance one step in the scientific principles of their art without experiment? Would they not now be where they were fifteen years ago, had not a few enterprising spirits among them experimented, and brought forth good fruit? That man who would counsel a course detrimental to progress in any branch of industry, is totally unfit for a teacher. Therefore, onward! is our motto, still onward! and fame and honor attend him who shall effect the most and greatest improvements in his art. Let not the lust of gain wholly absorb your minds, but give some portion of your characteristic energy to that which will ennoble you in the estimation of your fellow men; be like the great masters of art, of old: they not only strove

to excel all who went before, but assisted those who, coming after them, endeavored, in their turn, to overshadow them with the mantle of superiority.

—The article calling forth the following remarks, was scarcely worth the time spent upon the answer. All who read the *advertisement* in the *Tribune* could easily detect its purport, for “what’s bred in the bone will come out in the flesh.” We publish the note of our correspondent, as the evidence of one well versed in the matter, notwithstanding, we personally, as a matter of taste, repudiate coloring daguerreotypes altogether.

To the Editor of the Photographic Art Journal.

Dear Sir,—A short time ago the New York *Tribune* published in its columns a letter from Mr. Humphrey, editor of the *Daguerrian Journal*, relating to the indurability of colored daguerreotypes; and as the editor of the *Tribune* seems to decline publishing my answer, which was sent to the office a week ago,* I take the liberty of sending a modification of that answer to you, trusting you will have the kindness to give it a place in the pages of your next number of the ‘Photographic Journal.’ It is necessary that the public mind should be relieved from the false impression to which Mr. Humphrey’s letter is calculated to give rise; and that operators, both in this city and throughout the State, should be assured of the durability of the coloring. Had I not practised the art of coloring daguerreotypes for the last five years in Europe, I should not have presumed to refute Mr. Humphrey’s statement; but from his letter and his description of a process of coloring, given in his journal some time ago, it is evident he knows little or nothing about the subject. I therefore confidently assert, that the coloring is no more perishable than the coloring of any other style of miniature painting. And, in proof of which, pictures are to be seen at Meade, Brothers, colored by me, which have been exposed to a strong light for three months, without any

* Since this communication was received, the *Tribune* has published Mr. Werge’s note.—ED. PHOT. ART. JOUR.

diminution of their brilliancy. I further assert, that no composition whatever is used by me to prepare the plates for the reception of the colors, I having succeeded, after considerable labor and cost, in preparing colors to adhere to the plate, and enable the artist to produce any effect he likes, without injuring the surface or original beauty of the picture.

If you would have the kindness to call at the gallery, I should have much pleasure in producing a picture before you, that you might vouch for the accuracy of my statements. I am, dear sir,

Yours very respectfully,

JOHN WERGE,

Colorist for Meade, Brothers,
233 Broadway, N. Y.

New York, Oct. 8, 1853.

---The photographic paper processes are now commanding a considerable degree of attention among our daguerreans, and a large number are preparing to devote themselves to their manipulations. Among the best specimens that we have seen taken in this city, are those of Mr. Cutting, taken at Mr. Gurney's Gallery, and termed by him Mezzographs—a misnomer for which he had no necessity, and being superior to the mezzotint engravings, are too faithful representatives of photographic art, to “shine in borrowed plumes.” Mr. Root and Mr. Brown are also quite successful in their operations. The most perfect, however, that we have seen, were several little gems taken by Mr. Aulet of Cuba, W. I., an amateur photographer of fine talent and perfect skill. These specimens were excellent representatives of the pencil and graver. Mr. Whipple also continues to improve the crystalotype, and many of the results of his process are unsurpassed by any other.

—Daguerreotypists generally are not only doing remarkably fine business, but remarkably fine work. No era in the history of daguerreotyping has produced so many exquisite gems of the daguerreotype

art as the present; and the almost universal desire for improvement, gives evidence of a better appreciation of the art. We shall visit the “World's Fair” before our next issue, and then endeavor to furnish our readers with a description of the pictures there exhibited. We regret to learn the names of a great number of our artists, who have thought proper not to exhibit, as it deprives the world of a just knowledge of the extent and perfection to which the art is carried on in this country.

--We ought not to suffer another month to pass without noticing the excellent stereoscopic pictures taken in New York and other cities of the United States, and especially commend those of Mr. Peters of this city, who has probably brought this branch of daguerreotyping to greater perfection than any other, having been engaged exclusively in it since its first introduction. Mr. Mascher, also, of Philadelphia, is a very successful stereoscopist, and has invented the best stereoscopic case—if we except the lenses—which although they answer the purpose tolerably well, are far inferior to the regular stereoscope lense, made. We borrow from Mr. Mascher's circular, the following quaint instructions for taking these solid pictures.

“Prepare two medium size plates ready for the camera, and if you have two cameras of the same size and quality set them about 2 feet apart, and at equal distance from the person (subject); draw the focus correctly in each and take both pictures at one and the same time, finish them in the usual manner and you will find that both are not exactly alike, but each picture to look slightly to opposite sides of the plates; cut the plates so that they will fit a 1-4 size border and paste them together in such a manner that both pictures look to the middle of the plate, taking care that both pair of eyes are parallel with the sides of the border and glass. Or if you have only one camera prepare the two plates as above, adjust the focus properly and take one picture, let the subject sit perfectly

still until you move the camera about two feet either to the right or left, (it matters not which) readjust the focus and take the second, finish and put them up as before. It is self evident that two cameras are better than one, for by taking both pictures at one instant, the features in both the pictures will bear the same expression, whereas by one camera the person will be found to look much pleasanter in the first than in the second picture, yet I find that this does not injure the effect as much as one would suppose for my instrument possesses the singular property to assimilate two dissimilar pictures.

"I have taken a gentleman's picture on one plate and a lady's on the other and by placing them in the stereoscope they were blended together producing the most astonishing effect. The resulting picture is not a true likeness of the one or the other yet possesses the most prominent features of each, making a picture wonderfully like that of one of their children. Even if one picture should by accident be a little larger than the other it will make no perceptible difference in effect."

This last paragraph records a most wonderful effect indeed, of his wonderful little instrument, which should be borne in mind by all true lovers, who by having their daguerreotypes side by side in the stereoscope, will possess a perfect *infantometer*, and be enabled to anticipate the precise style of beauty, which is to rise up and gladden their double blessedness.

— We would remind our readers, particularly those who have already entered the list for the ANTHONY PRIZE Pitcher, that but two more weeks are at their disposal, for executing and sending in the pictures intended for competition. The published stipulations, for which see Mr. Anthony's card, requires the daguerreotypes to be sent by 1st of November, shortly after which the decision will be made. We scarcely think it necessary to state again, that this prize is a *bona fide* offer and will be awarded if there are but two or three competitors, and we must remark, that the few

names sent in exhibit a want of confidence in their own skill—perhaps cowardice—of the delinquents which we regret to see. It may be as well to mention also, that none are excluded from competition on account of not having previously announced their intention, previous to the 1st prox. All daguerreotypes sent for that purpose previous to the examination of the judges will be equally eligible.

— It may concern some of our readers to know that daguerreotypes are now admitted into England, free of duty; and therefore the only expense to which the sender is subjected is the carriage—about \$2. It is not unlikely that small parcels containing presents of any kind, will soon be admitted on the same terms.

— Henry Meade, Esq., of the firm of Meade Bros, of the city of New York, was married in Trinity Church, Wednesday, Sept, 7. to Miss Sarah A. Meserole, daughter, of the late John Meserole, Esq., of Bushwick, L. I. Although, we had not the pleasure of dreaming on any of the wedding cake, we most sincerely wish the happy pair all the felicities of the most lovely state of matrimony.

— R. S. J.—The rumor is a false one—we are in no way related to Mr. Hesler, by any tie most distant, unless, we go back to Adam and Eve. The falsehood could have been originated only for the purpose of injuring the influence of our Journal, as an impartial and fair critic, and we have no words to convey the detestation in which should be held the man who would give currency to so base and dishonest a falsehood, for he knew it was such when he uttered it.

E. W.—You will find him out one of these days, and then wonder how it was possible the daguerrean public could have been so long duped by him. His ingratitude and baseness towards those who have befriended him are proverbial.

P. H.—The crystolotype can be purchased of Mr. Whipple at a mere nominal sum. The propositions for a Joint Stock company were issued by other parties, who had made arrangements for the purchase of the process, but failed to meet their engagements. Mr. Whipple's other duties being severe upon his health, he was induced to thus trust the crystolotype in other hands. He is censured without cause by men whose interest it is to do so. Those who teach the paper and glass process in this city charge \$100.

M. S. J.—Mr. Cook's operation of enlarging his daguerreotypes, has nothing new in principle in it, and may be accomplished in the same way, by any one as enterprising and talented. However, the labor he was obliged to bestow, may be entirely obviated by the use of the *pantograph*, to be described in our next.

J. S. W.—We have not yet visited the Crystal Palace, but are informed that the daguerreotypes are not well exposed to give a true conception of their real merits. Several exhibitors have endeavored to remedy this defect with but partial success.

D. D.—We have not seen it, but we are informed on the best authority, that the recipe for making the "compound," so trumpeted for the purpose of making sales, is not genuine—the inventor never having given permission or sold it for publication.

G. B.—We can give you no reliable information on the subject. You must have patience.

J. S. W.—He is such an enthusiast and so much in the realms of ideality, that it is difficult to get him down to the common affairs of life. The other articles will be finished as soon as possible—Please be patient.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest

improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professors Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PLATE, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

The pictures must be forwarded to my address, free of expense.

E. ANTHONY.





HON. EDWARD EVERETT, OF MASSACHUSETTS.

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A GENERAL REVIEW OF THE DAGUERRETYPE.*

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SECTION XV.

COLLODION.



thought I had finished the subject of collodion. The title of a general review at least, which I have given to my articles, did not seem to require further explanations concerning it; but the collodion process is yet so new, so little known, and so fruitful in its results, that in continuing the study of it, I could dwell a long time yet on this chapter.

It will scarcely be believed that I could have passed several days without obtaining a single proof; the fact is nevertheless true. I however at length discovered the cause of my failure. I employed an *acid* collodion with acidulated acetate of silver, when the collodion should have been *alkaline*, the bath of silver being acidulated.

I now prepare collodion ready to use, in a few minutes, with gun cotton, ether, alcohol, ioduret of zinc and ammonia. This collodion is distinguished from every other by its color, it perfectly resembles milk; its sensibility is extreme; positive proofs may often be obtained in ten times less time than with the silver plate.

I have again tried the neutral bath of silver, and the acidulated bath. With the neutral bath no proof is obtained, the plate becoming veiled over its entire surface

through decomposition of the sensitive coating without intervention of the light.

I have also compared azotic acid with acetic acid for acidulating the bath; acetic acid appeared to me decidedly superior, but it is necessary to renew it often, and that there may be no failure, to habituate oneself to pouring a small portion of a new acidulated bath on each proof; without this a period occurs when the positive proofs cannot be distinguished on account of a very light greyish veil which entirely covers the plate. When this occurrence became known to me, I attributed it to the sulphate of iron, to the hyposulphite, to the cyanuret, etc.; in short, I ended by suspecting a want of acetic acid, and, to assure myself thereof, I added a considerable quantity of acetic acid to my bath; the sensitiveness became somewhat diminished, but the proof was no longer veiled by the blacks.

To arrive at the employment of a bath suitably acidulated for a given collodion and sulphate of iron, I cover a small plate with collodion which I pass through the bath of silver, and five minutes after submit it to the action of the sulphate of iron immersing only half of the plate; if this plate on its withdrawal is discolored by contact with the sulphate of iron, it is a proof that the collodion rendered sensitive is decomposed alone; it is then necessary to add acetic acid to the bath until it causes no further discoloration. At this moment the collodion is as sensitive as possible, for I again repeat, the sensitiveness and the clearness of the proofs depend on these three things together. The acid diminishes, but it gives clearness; the alkali hastens, but it veils the proofs. The greater the reducing power of the continuing liquid,

* Continued from page 220, vol. 6, No. 4.

according as it is prepared with pyrogallie acid or protosulphate of iron, the greater quantity of acid will be necessary to resist its decomposing force.

The duration of the contact of the plate with the bath of silver should also vary with the nature of the collodion ; a long stay in the bath certainly causes the collodion to exfoliate. After numerous trials, I ascertained that five seconds, and ten at the most, are quite sufficient, save that the exposition in the camera should be delayed to allow the filaments of liquid to run off, a precaution which is superfluous when the plate is fully bathed by a thin sheet of liquid, if the immersion has lasted at least a minute. If the collodion, at this moment, becomes detached *en masse* or suffers itself to become gradually washed away to the least drop that remains on its surface, there is no other way of remedying this serious inconvenience than by leaving the plate but a few seconds in contact.

That a collodion may be good, it is necessary that the point of contact does not cause a furrow which would gradually extend from one end of the plate to the other. If the sensitive coating be thus divided it is useless to think of obtaining a proof, it may be used, at the most, for trying the sensitiveness of the collodion. I had the idea of trying an extremely diluted bath of silver to determine its influence on the cohesion of the sensitive coating ; a bath containing at the most 1-200 of silver covers the plate still more quickly with ioduret of silver ; the sensitiveness does not appear diminished, but the pellicle becomes still more easily detached.

The best process for submitting the plate to the sulphate of iron consists in presenting the plate with the proof underneath and in almost a horizontal position ; as soon as the nearest edge touches the surface, the liquid immediately bathes the whole surface of the plate, in the least abrupt manner ; it is necessary to hold the plate thus without moving 10 or 15 seconds then to apply it in the same way to an acidulated bath of nitrate of silver, which changes the red tones to black.

To rinse the plate before immersing it in the cyanuret or hyposulphite, it will be well to hold its upper edge almost in contact with the faucet of a fountain running very gently.

All this relates to collodion in light coatings, for positive proofs are prone to exfoliate or become detached from the glass. Collodion little adhesive is not rare ; quantities are sold which cannot be used on account of this great defect.

Concentrated and solid collodions for negatives are put on in thick coatings which can remain a long time in contact with the bath of silver ; they allow of plunging the plate abruptly into the sulphate of iron, or of pouring the preparation of pyrogallie acid at once upon its surface. It is rare that this collodion is as sensitive. I believed for a moment that the cleaning of the glasses did not require as much care as is generally thought. This idea occurred to me from the remark I had made, that the proof is almost always superficial and rarely penetrates into the heart of the collodion ; but I have since observed that when the collodion itself becomes detached from the plate its lower surface becomes often covered with a pellicle of silver ; this penetration of the reduced silver is so subtle that I have often had plates entirely veiled by transversal strips which could only arise from negligence in cleaning. Since then I have become assured that the plate should be free from every reducing foreign body ; I rinse them with precaution with water containing azotic acid with white polishing powder. Iodureted zinc collodion, containing but a tenth of rectified alcohol is too dry and too granulous ; a large quantity of alcohol allows a smoother surface to be given it.

The process on collodion has strangely turned the mind from the employment of albumenized glass ; the question, however, of positive proofs, which are completed by employing five or six times less time than for negatives, allows of comparing the sensitiveness of albumenized glass with that of the silver plate. I intend occupying myself in increasing this sensitiveness, and probably my next article will prove that the albumenized glass, which has already given such perfect results, should not thus be abandoned.

VARNISHES FOR COLLODION.

Pictures on collodion cannot be preserved nor employed for drawing off positive proofs without being vanished ; the reduced silver which forms the lineaments of these deli-

cate pictures, being in a great measure on the surface. Drying off the collodion in the open air is insufficient to give it any solidity; it is moreover necessary to heat it with the lamps, it then becomes sufficiently resisting. It may almost always be polished with the finger; but the least dust streaks it, and one cannot venture to draw copies therefrom without running the risk of losing the proof.

To give it the solidity of the albumen, it must be varnished. I have been sent, on this occasion, two specimens of varnish to make trial of. One prepared by Mr. Plant—already known by his multiple frame—the other by Mr. Richebourg. The varnish of Mr. Plant has for a dissolvent as essential oil, and Mr. Richebourg's, spirits of wine. These two varnishes are of a reddish yellow, *en masse*, but very slightly colored when in thin coatings.

The varnish of Mr. Plant is applied to the plate after having warmed it with great precaution; that of Mr. Richebourg is used cold.

These two varnishes dry very quickly; at the expiration of a few minutes they have acquired all their solidity. On comparison Mr. Plant's is found to be less yellow and much better to resist any effort of the nail to scratch it. Both resist the rubbing of the fingers or of paper.

These varnishes are mentioned as capable of being used in giving transparency to negatives on paper; I shall early make trial thereof.

OX BLOOD ALBUMEN.

M. Flaridin, already known in the scientific world by his *Treatise on Toxicology* has succeeded in preparing on a large scale, and in discoloring for the use of the printed calico trade, albumen of ox blood. I thought this albumen might successfully take the place of egg albumen for photographic purposes. He could put up this albumen at a very moderate price.

He sent me two samples of it; the one in powder, and the other in dried shells. These two albumen dissolve rapidly in tepid water, giving a liquid of a slight yellow color, observing it *en masse*.

The powder albumen foams much more than that in the shell; filtered, it gives a liquid almost as clear as water, its yellow tone before filtration being doubtless

owing to the flakes of the same color which it leaves on the filter. This albumen appeared to give more sensitive plates than that in the shell, but this question did not yet seem decided. Ioduret of zinc cannot be employed, it coagulates the albumen; I made use of the ioduret of ammonia. The great advantage of this dried albumen would be to allow of immediately dissolving it at any time and in any place, without need of whipping it into froth and waiting for it to liquify, a tedious operation which is necessary in egg albumen.

From my experiments, it is necessary, as for collodion, to add to the albuminous liquor a few drops of ammonia, and to employ an argentiferous bath with an addition of acetic acid, if the acid protosulphate of iron be used for bringing out the picture.

PROOFS ON GELATIN.

I have made several attempts to substitute gelatin for albumen and collodion. I have some times obtained extraordinary results, which will cause me to persevere.

Many operatives pretend to have produced proofs from this substance; no one however, has made known the means of giving the requisite solidity to the coating of gelatin. I have accomplished this by employing tanin,* in the following manner.

I used isinglass as giving the finest and purest gelatin. I had boiled, for a few moments, a few fragments of sturgeon's scale which is sold by every grocer under the name of isinglass; I then added to it 15 to 20 grammes† of ioduret of ammonia to a quart of the liquid. Ioduret of zinc would not serve me for the same purpose; it coagulates the gelatin like albumen, but more slowly. The liquid having been filtered while still warm, I laid it on plates of glass.

To fix the coating of gelatin and at the same time to give it sensitiveness, I added to a solution of nitrate of silver, acidulated with acetic acid, a certain quantity of tanin dissolved in alcohol.

On immersing the plates in this bath, the coating of albumen takes an *extraordinary solidity*; the plate becomes yellow as ordinary, and placed in the camera, where I left it one day, for as long a time as it would be necessary to form a nega-

* A preparation to make bark fit for tanning.

† 290 to 360 grains.

tive on albumen, I happened to obtain on removal from the camera, a *perfectly formed positive proof*, a thing unheard of in photography. Passing however to the sulphate of iron produced little change on this singular proof, the effect of which from possible reduction had taken place in the camera, under the influence of light; but this fact denotes a principle of sensitiveness which requires to be looked into.

Albumen is tedious to deposit on glass plates of small size; I cover a large plate at once, and, the coating dry, I cut it into plates of small dimensions, to use when needed. I have already worked thus with a plate of albumenized glass which was given me for my experiments by Mr. Bisson, jr. I have made five or six plates of it, which have all given me satisfactory proofs; and, a most singular thing, these were the only proofs I obtained (although the preparation of this albumenized glass was many months old) during my days of failure with collodion which, at that time, did not even give the *silhouette* of the sky, because I had not yet discovered that it should positively be *alkaline*.

PROOFS ON ALBUMENIZED GLASS.

On comparison, collodion greatly exceeds albumen in sensibility, in the transparency of the positive proofs, and especially in the facility and rapidity of the preparation of the glass plates.

The only advantage of albumen is in allowing the preparation of a large number of plates in advance, and consequently to cover at once large window glass plates, which can be cut with the diamond into plates of every size, as soon as the coating is dry. I have just made trial of it; I have thus obtained 12 quarter plates from my smallest sheet. This sheet covered during the evening and left at rest a whole night in a place on a level with the ground, was not completely dry in the morning; presented to a very moderate fire, it became almost immediately filled with very fine cracks. Some writers advise continuing the drying of the albumen until the appearance of these fissures; I believe this to be wrong; very dry and uncracked albumen is perfectly coagulated on contact with the bath of aceto-nitrate of silver: I have once again proved, that albumen when cracked becomes wrinkled and loses much

of its transparency. I had purposely omitted filtering the albuminous preparation which had been made with whites of eggs; this resulted in a multitude of minute asperities arising from the mixture of the more consistent part with the fluid portion. I did not moreover protect the glass from the contact of the fingers in performing the effort necessary to detach the glass after the cutting of the diamond, to see precisely which would be the consequence. The mark of the fingers appeared, as may be supposed.

It is therefore, then, absolutely necessary to filter the albumen before using it, never to carry the drying to cracking, and carefully to avoid touching its surface with the fingers.

It is certain also that the addition of a viscous substance hinders the albumen from cracking; 4 or 5 five drops of molasses to a white of an egg, or the equivalent in honey, are not too much. The natural coloration of the molasses is no obstacle. The dose of ioduret may be 36 grains of the white of an egg, or 16 grains at the least, taking care to employ the albumen diluted with water to get it in a very thin coating.

Proceeding thus, I succeeded in obtaining positive proofs in a sufficiently short lapse of time, not so rapidly however as with collodion; their transparency was also inferior, by reason of the opacity which the coating of albumen maintained, which also lost considerable of its reduced silver by the hyposulphite or cyanuret wash, which is much less perceivable in collodion, especially in employing protosulphate of iron.

Albumen will always have its use for negatives, whenever it is proposed to operate dry, or one is prepared for time; but for direct positives, it appeared to me even inferior to gelatin coagulated by *tanin*.

I frankly avow too that the great number of questions which the employment of collodion leaves still to be resolved, divert me incessantly from the study of albumen and gelatin.

For example, I had believed 'till now, from the authority of M. de Brebisson, that the protosulphate of iron could give intense negatives. This is an error; with the sulphate of iron, in all its degrees of strength, of concentration and acidulation,

I have never been able to observe a *black sky*. The contrary effect is produced with the pyrogallie acid with the addition of acetic acid; the heavens and the portions illumined by the sun take an intense black which is a great obstacle to the obtaining of direct positive proofs; so that the employment of sulphate of iron, to which succeed the passing through the acid nitrate of silver, then the cyanuret at the tenth, is as special for direct positives as the acidulated pyrogallie acid, followed by hyposulphite at the tenth, is for intense negatives.

It is true that the *nominal* protosulphate of iron remains yet to be found.

As for the nitrate of protoxyde of iron, I prepared about 5 gallons with great care and although the liquid thoroughly reduces the salts of silver, it has *no action* on the plates withdrawn from the camera.

I have constantly submitted the proofs to the acid nitrate of silver, on removal from the sulphate of iron, that is to say, without washing them; these proofs are sometimes found veiled in the blacks, I suspected the nitrate thus employed to be the cause of it; I therefore desired to assure myself if the nitrate still acted after the washing of the plates; I poured several drops upon a plate washed with plenty of water; on withdrawel from the sulphate of iron, the part thus wet by the acid nitrate acquired much more brilliancy in relation to the rest of the proof. It will therefore be well always to proceed thus, that is to say, to pour upon the washed proof sufficient of the acid nitrate to cover it entirely.

By this process, the blues are avoided; the whites are sometimes very intense: more intense, for instance, than on the silver plate, and the solutions of cyanuret and hyposulphite at the tenth does not weaken them, especially if care be taken to make use of baths which have already been employed and which may be reinforced from time to time by a slight addition of fresh liquid.

M. BERTSCH'S COLLODION.

I have made numerous experiments with this collodion, which already enjoys some little reputation. This is a fine preparation which seems should eclipse the English collodion. I admit for it extreme sensitiveness, and I have obtained by its aid proof

as well positives as negative of great purity; but for this I have been obliged to add *acetic acid* to the nitrate of silver, without which precaution, the proofs I obtain are almost always covered with a general veil or speckled appearance.

This effect, little perceivable on negative proofs, which are always drawn on a grey ground, is incompatible with the production of direct positive proofs, which are then deprived of blacks and are scarcely remarked.

As for the rest, to every one who will make trial of it, it will be remarked that the proofs will become more and more fine in proportion as the quantity of acetic acid is augmented without the sensitiveness appearing in the least diminished. I have even succeeded in procuring upon this acetic acid, several drops of concentrated nitric acid. I have been, as well as many others, surprised at the high price of this collodion; but on using it, I perceived in it an unforeseen advantage, which makes this difference in price of no account. This collodion is of remarkable flacidity, it appears to contain a large quantity of alcohol, for it dries slowly and does not cool the plate like the other collodion. It leaves, definitely, a coating so thin, that one is surprised at the considerable number of plates that the contents of a single flask will cover. In a word, half the quantity of this collodion is necessary than of those thicker which are sold for half the price, so that there is a compensation.

The pellicle of ioduret of silver appears to unite with the collodion itself; on 30 or 40 proofs that I have made with very varied argentiferous baths, I have never seen it detached in any point.

I seize with haste the occasion which presents itself for eulogising an excellent production, which will be held precious in photography; but I maintain that it renders necessary the employment of acetic acid in nitrate of silver; for it is not my flask alone which by chance made the addition necessary. I have experienced the same necessity with M. Lerebours, and many other operators are dissatisfied, from having discovered this fact, which is totally opposed to the directions of the inventor. This arises from the fact that direct positive proofs can manifest themselves only in proportion as the blacks are deprived of

every deposit of salt of silver, which would surely pass unperceived on intense negatives fit for giving good positive proofs.

PREPARATION OF THE PRINCIPAL PRODUCTIONS FOR OPERATING WITH COLLODION.

The quality of the production is a matter of importance for working with so delicate a substance as collodion, which is successful or not according to the presence or absence of a few drops of an acid or a salt.

By obtaining these chemicals from houses of the first class, their purity may be relied on, but if they are purchased from petty traffickers, who supply themselves no one knows whence, one may pay very dear for these substances adulterated designedly or through ignorance.

I lately experienced this melancholy truth in relation to some nitrate of silver and acetic acid which had been sent me by a friend. The nitrate of silver had cost 5 francs the 25 grammes, and the acetic 2 $\frac{1}{2}$ francs the 50 grammes.

The nitrate of silver was crystalized, but it seemed damp; its crystals had not the appearance of solid and adamantine plates, as ordinarily; wishing, however, to produce very pure proofs, I poured into the residuum vase a bath which was working very well, but which at length forced a deposit.

What was my astonishment when I perceived that the nitrate, properly diluted with water, gave no trace of any proof upon a number of collodions including that of M. Bertsch.

When no proof is obtained, two essentially different cases are presented, which are distinguished by the shade of the ioduret of silver after the passage to the continuing liquid; by collecting the collodion in a heap its color may be perfectly judged of; if it is grey, it shows that the plate is totally veiled, because the silver is reduced without the intervention of the light; this may be remedied by adding acetic acid to the bath of silver; if, on the other hand, the collodion is still yellow, it shows that the light itself has not acted and that the bath of silver or the collodion are too acid.

In the present case, the collodion remained yellow; I therefore hastened to prove the bath with turnsol paper; to my great astonishment, it presented no acid

reaction. In adding acetic acid it may easily be understood, that my result was always the same. By dint of adding acetic acid, a large quantity of light soft flakes were formed, of silvery aspect, which appeared to me to be acetate of silver. I have sometimes had flakes of this nature, but in a small quantity; now, they were floating around in such great abundance as to render it impossible longer to operate. I therefore, poured the liquid into my residuums, and as some flakes still remained in the dish, I remarked, on attempting to rinse it with water, that the salt dissolved very rapidly, more rapidly than if it had been nominal acetate of silver. I then conceived the idea of trying the effect of this bath on a plate coated with collodion; it became yellow; but the collodion became totally detached. This confirmed the observation that I have very often made, that salts other than the nitrate of silver loo-en the ioduret.

The acetic acid had doubtless contributed to this result; for I perceived in it a property foreign to this body, having doubled its volume with water, in order to add it more easily in small doses. I agitated it and remarked with surprise that it foamed, proving that it contained foreign bodies, doubtless alkaline acetates. At last, tired with doing nothing, I poured lime water into a new bath until the formation of a persistent precipitate of oxyde of silver. For once, I obtained a very distinct proof, but entirely veiled. The addition of the same acetic acid produced the same fine precipitate, which again hindered me from operating. Having added this time a milk of lime, the bath congealed *en masse*; but without discoloring; it appeared composed almost wholly of the precipitate. From all this I had concluded that the crystalized nitrate of silver and the petty commercial acetic acid, contained salts opposed to the formation of the images; which was proved to me in very positive terms by a passage from M. Bertsch's pamphlet, which was sent me, and which will shortly be published.

To resume, I think that *white liquid* nitrate of silver should only be employed; which alone is well defined and free from acid. I have met with success whenever I have prepared this salt of silver myself, confining myself to drying by the fire without troubling myself about the

copper, which places no obstacle to the formation of the pictures; and even if I refer to the past, I have never better succeeded than in employing coppered nitrate of silver, obtained from pieces of coin, simply dried by the fire, until my bath of silver became green and changed to a sky blue in the place where I let fall a drop of ammonia.

PREPARATION OF THE NITRATE OF SILVER.

The silver of the residuum is precipitated in three ways; in filtering the liquid and putting in action the protosulphate of iron copper, in slips or marine salt. To precipitate the silver by the salt of iron, it is necessary to render the liquor alkaline by means of ammonia, and to employ crystallized copperas dissolved without acid. This silver is very disunited and deposits slowly. To precipitate by the copper, the liquor should be acid; the silver thus deposited, used with azotic acid, has always given me excellent baths, although they were not always free from copper. To obtain the silver by the salt, it is precipitated in white chlorine with a slight excess of salt, a few drops of sulphuric acid are added thereto, which facilitates the agglomeration of the chlorine and clears the liquid after decanting it, which leaves the chloride almost dry; a little sulphuric acid is added; a blade of zinc bent to a right angle, is then introduced into the middle deposit, the verticle extremity of which is held in the hand. On slowly removing the blade of zinc, the silver is found in a few moments completely reduced, and takes the form of agglomerated black flakes which it will be sufficient to wash in water changed a number of times, before adding the azotic acid.

I have often poured into the solution of marine salt my residuums filtered and changed with ioduret of silver; a nitrate of silver saturated with ioduret was the result, which remained thick after its solution. This nitrate did not make a good bath; nitrate of silver, however, dissolved in distilled water which has ioduret in suspension, becomes, by this fact, of a blackish grey and makes a very good bath. This bath, clear when warm, thickens slightly on pouring it into another dish; but the least addition of acetic acid clarifies it, precipitating the ioduret and partly dissolving it.

PREPARATION OF ACETIC ACID.

Acetic acid is prepared by submitting the acetate of copper, called verdigris, to distillation. It may be prepared very well on a small scale, with too narrow long necked bottles of different dimensions, the smallest filled with verdigris, the neck of which is set in that of the larger; both being placed horizontally, the larger bottle laid in an inclined dish containing fresh water and covered with a damp linen cloth which dips at its extremities in this water. The small bottle being heated by a spirit lamp, and gradually turned whilst the rag is moistened, the acid distils, presenting the appearance of a white fume which condenses without difficulty. By this means 900 grains of concentrated acetic acid may easily be obtained in 10 minutes. Care must be taken that no dust of the salt of copper be left in the neck of the smaller bottle, otherwise acid colored by the copper will be the result; as for myself I did not take this precaution, deeming it superfluous; acid which I have obtained slightly colored has done good service.

In pouring the sulphuric acid into a concentrated solution of acetate of lead until precipitation ceases, acetic acid is again obtained by filtering, but it is less strong, which is rarely however a disadvantage.

If sulphuric acid be poured on pulverized acetate of lead, the result is totally different from what might be conjectured; I expected a lively effervescence, and was about protecting my eyes therefrom: the action, however, is perfectly dull, the crystals remain clear, and the acid seems to act like oil poured on salt. A sufficiently large quantity of water must be added in order to remark any disturbance and to perceive the odour of the acid.

I have tasted the acid prepared with dissolved acetate; its taste appeared to me very flat.

PREPARATION OF ZINC AND IODURET OF AMMONIA.

Ioduret of zinc is quickly prepared, by introducing into a long narrow necked bottle, flat on the bottom iodine, spirits of wine and zinc powder, and heating with the lamp until a discoloration of the liquid, which, after filtering is an excellent preparation for iodureting the collodion. This

ioduret of zinc, diluted with water and poured into a precipitate of carbonate of zinc; the ioduret of ammonia, left in solution is evaporated by a gentle heat to dryness; it is the ioduret of ammonia which is employed like dry ioduret of zinc for ioduretting the collodion, without the intervention of water, which cannot be done with ioduret of potassium.

Independantly of the purity of the chemicals even collodion requires to give it all its sensitiveness, a special bath of silver in point of view of the acid or alkaline reaction; it is definitely necessary that the pellicle of ioduret of silver become moistened by nitrate of silver,* not neutral, but as little acid as possible; sufficiently acid not to be reduced by the continuing liquids, and not sufficiently acid to resist the action of the light, the effect of which is to free the acid, which, under this influence, evaporates and settles on a neighboring body. In a word, as M Seguiet remarked to me, all collodions are good, but one must know how to use them; that is to say, to make the bath of silver harmonize with them! I have obtained proofs from collodions which before produced none, as well by adding ammonia and azotic or acetic acid as by adding to the bath of silver lime water or acetic acid, as the case might be.

For more constant success, it will be well always to preserve the same bath, adding, from time to time, when needed, nitrate of silver and especially acetic acid, which very quickly evaporates. Each plate carrying away a portion of the liquid, it is not to be feared that the alkaline nitrates may so greatly accumulate as to clog the proofs; for every operator has remarked that a bath suitably supplied always keeps good.

It is the same thing with the baths of cyanuret and hyposulphite; fresh baths devour and veil the proofs. I experienced very recently this disadvantage in the cyanuret; having entirely renewed it, this false precaution hindered me from fixing them well without the danger of impairing

them, which obliged me to employ pyrogallie acid and hyposulphite, finishing with corrosive sublimate acidulated with chlorohydric acid. This last acid lightens the most intense blacks: these lights are often bluish, there are sometimes exceptions however, and if I made the remark about this unlucky trial, it is because I almost fixed my proofs with cyanuret of potassium, which is never completely removed by the washing, and which never fails to form Prussian blue when the proof has been passed to the sulphate of iron.

Corrosive sublimate only succeeded well with collodion of great transparency, having given proofs directly positive of the most beautiful black fur, without this, these blacks are veiled by a light bluish tone, which gives the picture a flat look.

CONTINUING BATHS FOR COLLODION.

The obligation one is under of pouring the pyrogallie acid on sheets of glass, without being able to use it in a bath like the protosulphate of iron on account of its easy decomposition, had induced me to make fresh researches on the salts of iron.

The protochloride of iron obtained by the mixture of the sulphate of iron with the chloride of calcium does not act, as one might suppose, by reason of the precipitate of chloride of silver which it forms. The pyrolignite of iron brings out the proofs, but it gives them a blackish tone in the non-affected portions, which could hinder from obtaining direct positive proofs with this agent. The result which I obtained at the first trial with this liquid, which, as is known, is highly colored, induced me to try the acetate of protoxyde of iron, prepared by double decomposition.

I prepared one side with a solution of acetate of lead, and on the other a solution of sulphate of iron, employing these salts in relative quantities indicated by their equivalents, that is to say 9 parts of salts being completely dissolved, I mixed the two liquids; an abundant and very dense precipitate of sulphate of lead was formed, which was separated by filtering.

I have thus obtained a clear chestnut colored liquid, which after the addition of a small quantity of acetic acid, gives proofs as fine, if not finer and purer, with pyrogallie acid; unluckily they are rather red, and the fixing liquids make them *disap-*

* The use of turnsol paper is indispensable to get at the state of the collodion, which shows itself, but slowly, by viewing the paper on the service side. Operators who do not know how to use this paper, are not able to use different collodions, still less to pronounce upon their relative merit, since they work blindly.

pear in the twinkling of an eye. I do not doubt that this bath may one day be capable of completely filling the place of pyrogallie acid. I had not sufficient acetate of lead to vary my experiments, but I was so struck with the proofs obtained by this bath, that I have resolved to prepare very soon a large quantity of it, to prove it in every degree of concentration and with divers acids.

Till now, one was contented with employing reducing acids only; their combination however, with the alkalies, acts upon the proofs in a peculiar manner, it is thus that the alkaline *gallates*† suitably acidulated may form an excellent continuing bath.

It is understood that the variety of the substances to experiment on and the numerous combinations to which their association in different degrees may give rise, forced me to digress completely from the title I had taken of a general review; therefore, for the future, I will publish these articles under the title of *Photographic researches*.

For my general review, I have nothing now to treat upon but negative proofs on paper. The only advantage of these negatives is the facility with which they are transferred, for one can no longer dream of using them for portraits and for small dimensions, their design is too rude; I even think that we will very soon succeed in substituting thick leaves of collodion detached from the glass for negatives on paper.

I have tried fine unsized paper coated on both sides with collodion. This paper passed to the nitrate of silver and placed upon a well adapted piece of glass succeeds very well with the sulphate of iron; but not with pyrogallie acid, on account of the air which this acid encounters on the back of the sheet, which it infallibly blackens.

The collodion which I employ thus should have been clarified with alcohol containing ioduret and a certain quantity of water to render it dull; without this precaution the sheets would be glossy, scarcely permeable by the nitrate of silver, and would not give fine blacks. Every sheet must be dried by suspending it in the air, and one must shun laying them on anything whatever while still damp; it would produce blemishes.

I shall terminate the article *collodion* of my general review, with a hasty account of the innumerable varieties which this production presents and which require as I have so often observed, that each flask of collodion be employed in a particular manner, to draw from it its whole possible result.

The ingredients with which collodion is prepared are generally acid; gun cotton may contain sulphuric acid or azotic acid; ether always contains a small quantity of sulphuric acid and acetic acid; alcohol is rarely free from acetic acid; lastly, the alkaline iodurets, rather unstable, always contains an excess of iodohydric acid.

When the chemicals are found to be all acid together, a sluggish collodion is obtained, even with liquid nitrate of silver, and sensitiveness can only be reached by rendering the bath ammoniacal, which often causes the detachment of the pellicle of ioduret. A good method of giving sensitiveness is to have the diluted nitrate of silver boiled with ioduret of silver, precipitated and washed.

As to the preparations of ether and alcohol, they influence the cohesion of the collodion; ether predominating the pellicle is very fine and suits the negatives; and if the alcohol, there is more sensitiveness and the collodion is better adapted to direct positives.

The proportions of the ingredients is little important for a good collodion; I happened to produce an excellent collodion by uniting all my samples in a large vase; I have thus mixed together collodions milk colored, red, brown, containing oxyde of zinc in suspension, cyanuret of potassium, gallic acid and all the alkaline iodurets; this *melange* ended in clarifying, and proved on use a solid collodion of great sensibility, after I had always properly acidulated the bath of silver for this collodion which was alkaline, by reason of the ammonia I had introduced therein to saturate the acids.

Nay more, after having laid to one side the pellicles from a number of plates passed through the sulphate of iron and through pyro-gallie acid, after having washed and dried the pellicles, I have returned them to the ether, as with gun cotton and after the addition of an ioduret I obtained collodion most successfully.

† Salts extracted from nut-gall.

It often takes very little to cause a collodion to pass into an acid state. A flask which has been used for a long time, and which receives the excess from the plates, acidifies more and more; this happened to me with one of Bertsch's flasks, which required a bath less and less acidulated; a drop of ammonia added to the collodion remaining rendered it as clear as water, and I obtained then with my acidulated bath as pure proofs and with as great rapidity as on the first day.

It is doubtless an acid reaction of this kind which disappointed me with a very sensitive collodion which was given me by an operator, whom I esteem as the best in Paris; this collodion was sent me with the direction to employ only a neutral bath of silver and to leave the plate a minute at the least in the bath. I dissolved expressly nitrate of silver in water; curious to see the effects of this collodion, I left the plate a minute and-a-half in contact; but I only obtained, at the end, a very feeble silhouette of the sky.

With acetic acid there was no impressions, which made me conclude that this collodion had acidified while transporting it, so as to exceed the quantity of acid required to resist decomposition out of the influence of light, and to present still another accident for the production of pictures: by adding concentrated ammonia to this collodion drop by drop, I at last succeed as ordinarily, which proves that it will never do, to draw a hasty judgment on a collodion, since the same flask slightly modified passes from the maximum to the minimum of sensitiveness.

The blacks of the negative proofs may be much strengthened by pouring acidulated nitrate of silver upon the plate still covered with sulphate of iron, and returning it afterwards to the sulphate; but it is necessary to work in the dark; for I am certain that a plate covered with the sulphate of iron, and left for a long time in full light never changes color; but it totally blackens, if, after this exposition, the nitrate of silver be poured upon it; and so true is this that a plate passed to the bath of silver,

then the sulphate of iron, and exposed in the camera gives a proof as ordinarily, on pouring on again acid nitrate of silver, instead of plunging it into the sulphate of iron. These proofs do not seem to me as decided as by the ordinary process.

It remains to be said that great attention must be paid to the choice of the cyanuret of potassium. The cyanuret in plates is very bad; it is almost entirely composed of caustic potash, which precipitates the sulphate of iron in the red oxyde state, however little the perfect washing of the plate may have been neglected, and it prevents the obtaining of fine blacks in the case of direct positive proofs; the best cyanuret comes in small white detached grains.

Hypopulphite of soda at the tenth, and even concentrated, is not then a disadvantage, but it does not produce such beautiful blacks. This same caustic cyanuret is not proper to be used for removing stains from the fingers; it corrodes the skin, and puts it into a state of intolerant dryness. I have experienced no other inconveniences from the cauterization of the fingers, than a diminution in the sense of touch and a chapping of the skin. I have designedly allowed this to grow worse, to become acquainted with the total effect of it, and whenever I made use of the caustic cyanuret I experienced an insupportable dryness in the fingers, which I only attributed to the causticity of the salt, and not to its intrinsic nature, which is not so formidable as is said. Concentrated hypsulphite of soda, to which ammonia is added, assists in removing the colors given to the fingers by excess of iodine.

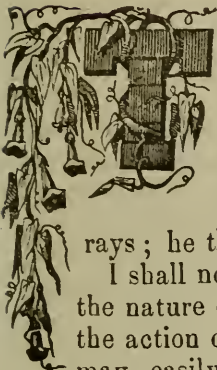
After the first washes I recovered the sense of touch, and by washing thus every day, I shall soon have my fingers as clean as mankind in general. I have three months persisted in not applying any reagent, in any way, but to understand its power and inconveniences; by taking the stains at once, it will always be easy to free oneself of them completely at the end of each day.

M. A. GAUDIN.

From the Jour. of the Phot. Soc.

ON THE APPLICATION OF THE MICROSCOPE TO PHOTOGRAPHY.

BY REV. W. TOWLER KINGSLEY.



THE author commenced by a brief account of the laws of refraction, the nature of the prismatic spectrum, and the separation of a ray of light into the heating, light-giving, and chemical rays; he then said—

I shall now proceed to state what is the nature of the change produced by the action of light on silver salts. We may easily conceive that the molecules of the simplest substances of which a compound body is formed are capable of different periods of vibration, like two strings of different notes; and hence, if the vibrations of the luminiferous æther are taken up by one substance and not by the other, and the chemical affinity of the one for the other is at the same time feeble, chemical decomposition would ensue—This, at any rate, seems to be a reasonable view of the case. The salts of silver are very easily decomposed, and there is always a tendency in them to allow the silver to return to the metallic state. For instance the oxide of silver is reduced to the metal by heat with great ease, or by placing it in contact with any substance that has a considerable affinity for oxygen. This action, however, is much more rapid if the process be carried on in strong sunshine. The iodide of silver follows the same law; but bromine and chlorine have a greater affinity for silver than iodine; and if we expose iodide of silver to the action of bromine or chlorine, or of both in order, we shall disturb the feeble affinity of the iodine for the silver, and render the compound so unstable that the action of light is quite able to reduce the metal; and if we stop short before we reach this point, it is still possible to carry on the further reduction of the metal by the use of substances which have a slightly greater affinity for the iodine than the silver has in its new altered condition. The process constitutes the whole practice of photography; for

though other metals than silver can be used for the purpose, it is the cheapest as yet known that possesses the property of returning to its simple form with sufficient ease for the purpose.

The process of Daguerre, as now practised, is to expose a polished and clean silver plate to the action of the vapour of iodine, and then, for a very short time, to that of bromine, and then a second time to that of iodine. This treatment coats the plate with iodide of silver, and then liberates a portion of the iodine, bromine taking its place. The image of the object to be delineated is now formed upon the plate, and then the plate is exposed in the dark to the action of the fumes of mercury, which in a short time whiten the parts that the light has acted on. It used to be thought that the image was formed by particles of mercury being deposited upon the surface of the silver. This, however, I am sure, is quite a mistake; and though I am unable to explain the whole action that takes place, I have no doubt of the nature of it. The vapour of mercury has a decided affinity for oxygen, iodine, bromine, and chlorine; when therefore, the plate is exposed to it, the vapour deprives the iodide of silver of its iodine, and deposits pure silver. When bromine and chlorine are also present, silver is reduced, and at the same time salts of mercury are formed; and I have no doubt that the different colors of the lights, according to the different proportions of iodine, bromine, &c., are due to these salts of mercury; but as the quantity is very minute, it is a matter of great difficulty to detect them,—calomel and the black oxide I have detected. After the plate has been acted upon by the mercury, it is fixed by first removing the unreduced iodide by a bath of hyposulphite of soda, and then by gilding it slightly with hyposulphite of gold. If the action of the light be too strong, metallic silver is formed at once, and then the mercury unites with it, and forms an amalgam that is not

as light in color as the silver reduced in the first instance. This seems to be one of the points where there is hope of gaining by further experiments; for if some way of reviving the silver has not actually reduced the silver can be discovered, without destroying the revived parts, we should be able to make sure of every plate by merely giving time enough to the exposure to the light. I may mention that the vapour of aldehyde gives promise of effecting this object. As a deoxidizing or deioidizing agent, it is most powerful, but the difficulty is to restrain its action. For the microscope, Daguerreotype plates prepared in the usual manner are quite capable of receiving an impression in about a minute's exposure. These impressions, however beautiful, will never be as useful as those taken on glass or paper, and which admit of being copied photographically.

The most simple process is that known under the name of the Collodion Process, introduced by Mr. Scott Archer.

It is not worth while to describe the method of making collodion, as it can be bought ready made as cheap as it can be made. With it a very small quantity of iodide of silver, dissolved in iodide of potassium or in cyanide of potassium, is mixed. This is now to be poured on a plate of glass, and the excess poured off again, so as to leave a film of the preparation on the glass surface. The plate is now to be plunged into a bath of nitrate of silver, 30 grains to the ounce of water; and as soon as the whole of the plate will retain the water without running into streaks, the plate is to be exposed to the action of the light; then it is to be plunged into a bath of pyrogallie acid, 3 grains; water, 1 ounce; glacial acetic acid, 1 drachm. This deioidizing bath develops the image; the unreduced iodide is then to be removed by hyposulphite of soda. This is the ordinary process, and the method is simple and good. If we add to the collodion mixture a small quantity of iodide or bromide of iron, and develop with protonitrate of iron, the process is rendered much more energetic; for we obtain on the plate, as soon as it goes into the silver bath, nitrate of iron, which deioidizes the plate as soon as the light strikes it. I do not find these preparations of iron to keep well, and therefore the preparation should be made only a

short time before it is to be used. Iodide and bromide of arsenic are also admirable accelerators and appear to keep for months without change; with them either the pyrogallie solution or protonitrate of iron may be used. I do not think that the collodion process will be as good as the paper processes, because it is a very difficult matter to coat large glass plates; and after they are finished, they take up a great deal of space; also, they are more troublesome to take positives from.

I may here mention that albumen, treated exactly the same as the collodion, only dried and heated after being poured on the glass, acts just as well and as quickly.

I shall now describe the method of preparing the paper I use. I have no doubt that many others are just as good.

I prefer Canson's paper, and use it either waxed or not, with nearly the same results; but the waxed paper is more easily managed, on account of its not becoming so tender from soaking. The paper is first to be soaked for some hours in a bath composed as below:—

Distilled water, 1 pint;
Iodide of potassium, half an ounce.
Bromide of potassium, half a drachm;
Fluoride of potassium, 1 drachm;
The white of two eggs.

If this is done under the air-pump so much the better. The paper is now to be hung up to dry, sheet by sheet; and so prepared it keeps well, certainly for months. If arsenic be added, as in the collodion, the paper is more sensitive. When it is to be used, it is to be plunged into a bath composed as follows:—

Nitrate of silver, 30 grains;
Acetic acid, half a drachm;
Distilled water one ounce.

After the paper has become saturated in this bath, it is to be placed on a sheet of pure blotting paper, and that on a sheet of glass to which it will adhere from the superabundant fluid; it is now to be exposed to the action of the light for the required time, which of course depends upon the intensity of the light; with my microscope, from two to five minutes is quite enough. It is then to be developed in a bath of saturated gallic acid; if the image does not seem dark enough in an hour, a few drops of the silver bath should be added. Hyposulphite of soda as usual is the fixing

agent. The silver may be used over and over again, if it be filtered with animal charcoal after each time it is used, or as soon as it shows the least sign of becoming discolored.

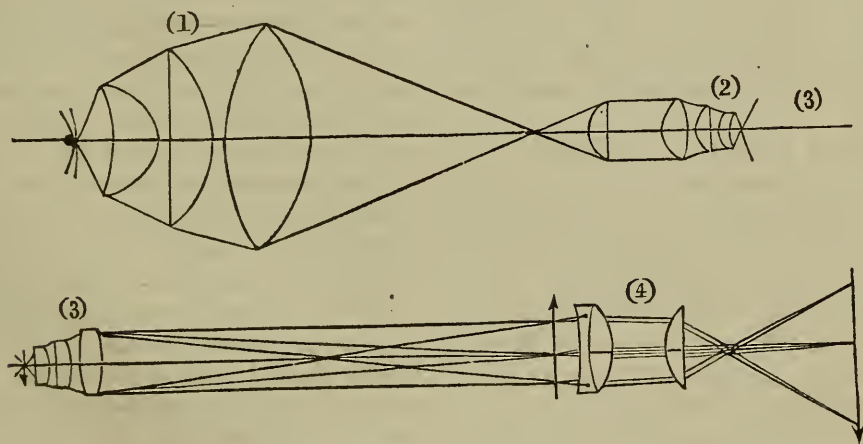
In these processes we have the affinity for the iodine disturbed by the action of the light; the developing agent carries this further, and the oxygen of the air or water or acid, which has always a slightly greater affinity than iodine for silver, combines with the liberated silver and produces the dark parts of the impression; if the action is carried still further we get the silver revived; and in the collodion process this produces a positive. To obtain these collodion positives, the quantity of silver in the collodion should be small, and the exposure only for an instant; after the plate is developed and fixed it should be put into a bath containing either aldehyde or grape-sugar, which will revive the silver with great brilliancy. The paper pictures may be developed by placing them in the mercury box, but it is not a good way of doing it. There is one use of the collodion which is of service. In the use of very

high powers with very delicate objects it is not easy to see the image formed on the v. sculine screen as described hereafter.—

When therefore an approximate focal distance has been obtained, a collodion positive on a small scale of a portion of the image can be taken in a few moments, and so the correctness of the arrangements tried before placing the paper in its place.

I shall now proceed to describe the instrument I use. Sunlight is of course far superior to any artificial light, when we can obtain it; but as the sun will not shine whenever we choose, it is of the greatest importance to construct the instrument for artificial light, and then modify it so as to be applicable to sunlight. The light I use is the common oxy-hydrogen light; magnesia or quartz may be substituted for the lime ball with advantage.

The optical parts of the instrument divide themselves into four groups. The light collecting, the condensing, the objective and magnifying lenses. The first group (1) for collecting the light consists of three lenses; the first a meniscus of about three inches focal length and two



and a half diameter, the second plano-convex, and the third a double convex with the radii of the surfaces one and six; the focal lengths of these two lenses being respectively six and eight inches.

The second group, or condensing lens (2) is a similar one turned the other way and on a reduced scale to suit the different object-glasses; between these two systems there is a plano-convex placed at its focal length from the focus of the collectors, so as to allow the rays to pass parallel to the

condenser. This lens and the condensers must be changed with the object-glasses; for it must be borne in mind that we have to arrange the instrument so as to make the image of the lime ball just cover the paper to be acted upon; and so if we diminish the focal lengths of the condensers at the same time that we increase the magnifying power of the instrument, we shall have just as great an amount of light with the highest as with the lowest powers.

The next group of lenses are those of the

object-glass (3), which requires to be very much under corrected for visible color, leaving strong red fringes. A very simple way of making the object-glass of an ordinary good microscope do for photographic purposes is to have a new front lens made for them; so that they can be used for either the ordinary or the photographic microscope. At this point of the arrangement we have a very good form of the oxy-hydrogen microscope; but it is a bad one for photography, as we cannot have the screen on which the image is to be formed, so near as to enable us to use the slow motions of the various arrangements at the time we are looking at the image, except for very low powers.

We now come to the last group which occupies the place of the eye piece of the ordinary compound microscope. This group is a form of the Ramsden or positive eye-piece, which ordinarily consists of two plano-convex lenses, placed at two-thirds their focal length, which is the same in both, and with their plane sides out (4). This eye-piece is not achromatic, being under corrected. The addition of a plano-concave flint lens to a double convex crown is used by me in the place of the lens next the object. This enables me, by a slight change of distance, to make the correction perfect.

I have now only to describe the best way of using this instrument; and here, it must be remembered, that all depends upon the object-glass being good; it is very easy to get one of small angle that will give very sharp outlines of objects, but we must not be content with such images as these; we must get object-glasses of large angular aperture, made perfect for this purpose, so as to show well the structure of objects, as well as their outlines. This is quite feasible. Suppose then, that we have got a perfect instrument.

At the place of the focus of the object-glass place a screen of æsculine,* and a dark

blue glass between the collectors and condensers; we shall now, "thanks to Professor Stokes," see the chemical image; and the correction for spherical aberration must now be made in the ordinary manner.—Now put in the eye-glass or magnifier, and the æsculine at the screen, and adjust the focus. This focus will be found, even in the case of chemically corrected lenses, beyond the visible; but in the case of the ordinary best object-glasses, the difference, is enormous; for instance, in the case of a very fine one-fifth in my possession, if I form an image at one foot from the eye-glass, I find the chemical image ten feet further back; of course such a lens is of no use for photography.

The æsculine also enables one to see at once when the light on the screen is the most intense for chemical action.

In conclusion, I have to state that one of the specimens sent was taken upon a disc of five feet in diameter, which was illuminated equally, and therefore anything may be taken on that scale on paper with artificial light, and I dare say on a very much larger scale still. I look upon it, therefore, that we must give our chief attention to the corrections of the lenses, as all the other parts of the process seem to acquire little further than mere care in the use of common formulæ. I have also to add, that the focal length of the condenser being selected, in order to give the image of the incandescent spot of lime on the right scale, its angular aperture should be a shade less than that of the object-glass.

Also, if a spot of tinfoil be placed on the condenser, we can get the object bright on a dark ground; and if an opaque object be placed in the focus on the collecting lenses, and the object-glass and eye-piece be turned round to the front of the object, a very good image may be got with low power.

* A new alkeline substance, said to be found in the horse chestnut.

DESCRIPTIVE SKETCH OF THE ENGRAVING OF THE VILLAGE PASTOR.*

BY MRS. S. C. HALL.

"The service past, around the pious man,
With ready zeal, each honest rustic ran;
E'en children followed, with endearing wile,
And pluckt his gown to share the good man's smile."

It is a great and a delightful privilege to be able to introduce into our homes so delicious an episode in genuine English life; to feel, when we look upon Mr. Frith's charming picture, that it is no fiction,—and that although the dresses appertain to a past century, the characters—the love, and faith, and innocence—are with us still. We pray they may continue to be so as long as England exists.

There are those who insinuate that the hope and trust which the English peasantry once gave to their "spiritual pastors and masters" are no more—that it is with the poetry of the *past*, and has little or nothing to do with the realities of the present; but it is not so: those who send forth these tales, and seek to pollute the fresh and pure waters of life by evil principles and doubtful imaginings, know nothing of the actual state of our rural districts; but write of what they *desire*, rather than of what they *know*. It is no doubt certain, that in the immediate neighborhoods of our large cities, the pastor's influence is not as great as it is in those far-away villages where the railroad whistle is as distant as the eagle's scream, and the agriculturist barely draws by labor sufficient from the soil to supply his moderate wants; *there* the Vicar is the poor man's bodily and mental physician;—he is emphatically his "friend;"—he receives him at the font, weds him at the altar, and consigns him to the grave;

"——— he is his Oracle."

In the beautiful and forcible words of the poet who inspired Mr. Frith with one of his purest and most exquisite fancies: he

"Allures to brighter worlds, and *leads the way*."

Many portions of the picture as drawn by Goldsmith of the country Clergyman are so charming, that they merit, accord-

ing to the old phrase, to be "written in golden letters:"—

"Thus to relieve the wretched was his pride,
And e'en his failings leaned to virtue's side;
But in his duty prompt at every call,
He watch'd and wept, he pray'd and felt for all:
As a bird each fond endearment tries,
To tempt its new fledged offspring to the skies,
He tried each art, reprov'd each dull delay,
Allured to brighter worlds, and led the way."

The whole poem is exquisitely beautiful and true: we extract only that portion which was more immediately the source of Mr. Frith's inspiration; yet how much of the detail do we not owe to the creative genius of the painter!

The centre of the foreground strongly expresses the poet's meaning:—

"E'en children followed with endearing wile,
And pluck his gown to share the good man's smile."

The benevolence of the Pastor, and the loveliness of the child escaping from her mother's hand "to pluck his gown," is full of the poet's fervor and the painter's feeling. The child, whose full fresh beauty contrasts so touchingly with the "beauty of age" as personified in the old Clergyman, is in itself a picture; and while the mother's hand makes a feint to withdraw her darling from the good man's "gown," there is an expression of happiness in her eye and smile, which is at once "motherly," and indicative of her veneration for her Pastor. The husband's attitude and bearing is in admirable keeping with the scene; and the young mother in the background, holding up her infant with joy and pride, while endeavoring to direct its attention to the Pastor, is one faithful episode among the many episodes which Mr. Frith has introduced with such admirable skill and exquisite feeling. Behind the little triumphant child who *will* be noticed, is another, whose face expresses a combination of the most earnest veneration for the Pastor, and astonishment at its little companion's presumption; this figure is in shadow, and makes an admirable background to the foremost child, while it is of much value in the group. Every face is instinct with

* From a picture by W. P. Frith, Esq., R. A.

life, and expressive of a distinctive character; to the right of the Clergyman is a very stunted little one, who, grasping her grand-dam's apron, glances timidly upwards, the old woman is leaning with crossed hands on the top of her staff; there is a world of affectionate and almost familiar respect in her eyes, as they should say "Bless him I've heard him these many Sabbath; but he is hale and hearty still,—and so he ought to be,—he is not as old as I am! no, no, thank God! he is not old!"

The background space between the Pastor and this village dame is filled up by three heads, and though in the distance, they lose nothing of their interest: there is the handsome haughty face of the young squire, contrasting with that of the gentle and loving wife, pleading with him on behalf of an old man, whose bare head, meagre face, and anxious upturned eyes, show the nature and object of his petition. It will not, however, be granted,—that haughty brow, and firm-set mouth, will not relax! Near the churchyard gate, where the ascending steps show the way out, is a group of old calculating men, engaged, it may be, in a theological disquisition: and it *may be* that one, the orator of the party, is expounding the text to his less-gifted neighbors,—to that open-mouthed "Hodge," who looks as if he could "discuss" nothing but Bacon; and to a sharp, clever old gentleman in spectacles, the very personification of a doubt: or it may be, that secular feelings have for a time rendered them forgetful—even at the gateway, and while yet amongst the graves—of "the Word" which has been so faithfully rendered by the shepherd of the flock,—that flock going forth into the world, many with good resolves, to be tried and shaken by that day week: or it may be, again I say, strengthened so as to fight the good fight bravely, seeking the Pastor within the sanctuary of his own peaceful home, there to gird on new armor, and strengthen the old,—having resort to prayer, and pouring out the soul in thanksgiving, beneath the blessing of the "good man's smile,"—the smile of him who has frequently realised one of the joys of heaven within his simple vicarage, feeling more joy "over one sinner that repenteth, than over the

ninety and nine just men, who need *no* repentance."

Behind the argumentative group, there are two,—little more than boy and girl,—*not* brother and sister, certainly *not*; two—on the threshold of earthly love, that was blessed by God for his creatures. The youth—comely, handsome, full of earnestness, *looking* if not making love; the words are naught, but the *manner*—the manner tells the tale; and the girl, so lowly-looking and lovely,—not "casting eyes" around for admiration,—but modest and devout: the Pastor's words ringing upon that young heart which is beating with a new-found emotion. Never was a gentle love-passage more sweetly rendered; earthly love though it be, it is so truly hallowed by the simplicity and meekness of the maiden, and the respectful greeting of the youth, that it is no way out of place or irreverent in that fine old churchyard.

But the most touching episode in this painted story, which else had been all too sunny, is what by the artist's skill is rendered of so much advantage to it, as a composition; giving firmness and breadth to the foreground: seated on a tombstone, is a widow, who has no greeting to give her spiritual teacher; her aged eyes are so full of tears that she dares not raise them; her heart so overflowing with sorrow, that she cannot speak; the world has not gone ill with her; she has all that she can desire of humble prosperity, she is well clad, well fed, well "to do;" and yet beneath the pressure of that dear head, leaning against her with the deepest, the most endearing, the most powerful of all earthly passions, her heart trembles; she knows that her best, her beautiful, her holy child,—the daughter bequeathed to her by her husband on his death-bed, cannot be long with her. She knows that her daughter is called HOME!

It is impossible by description to do justice to the sentiment of these two figures. The daughter's face is seen only in profile, so that its almost transparent thinness is marked by the sharp but delicate outline of the features; the hair looks "astray" and damp; the eyes uplifted to the preacher's, are bright and excited; the thin hand falling listlessly upon her dress, says as eloquently as if it had the power of speech,

"I am worn of the world, and my strength is faded;" the air comes wooingly unto those heavy tresses, for she could not bear pressure of the hood, which is thrown back from her throbbing brow. She desired so earnestly to hear "the good man" preach once more, that her mother has taken her to church; but she could not remain there. The words conveyed no meaning to her soul, thirsty for the truth; for her head swam, and before her eyes floated a mist; and the music all too much, made her think she had passed into the regions of the blest, her mother still beside her, and there the Angel—a heaven full of Angels—chaunting Hosannas to their golden harps, overwhelmed her; and, fainting on her mother's shoulder, she was led from God's house—not to her home as yet—no, she would wait her Pastor's coming forth, and see him once again in the old Church-yard, where she too, in days gone by,—a bright sweet, sunny child, had

"pluckt his gown

✠ To share the good man's smile."

The contrast between the faded girl and the budding child is highly poetic, and is rendered with the happy skill of a great artist. Such lessons in life can be given—either with pen or pencil—only by the hand of Genius, sanctifying the "things of every-day" to a high and holy purpose.

Mr. Frith is essentially a painter of English life; which, though he never so much refines upon as to depart from its essential character and qualities, in his hands is purified from every taint of coarseness or vulgarity. He has a great deal of sentiment, which fortunately is based upon the soundest principles of art: he could not caricature; his nature is too refined; his sound and matured judgment prevents that refinement from shrinking into weakness. In his hands a peasant is a rustic, not a boor; and his combinations are as true and beautiful, as they are effective.

We owe him much for much enjoyment: we read with delight—and for instruction—all the productions of his vigorous and graceful pencil: but in the work of which we now write, he supplies us with a theme for thought as well as joy: making glad the heart, while he exhibits the Artist as a great triumphant moral teacher.

Mr. Frith has been fortunate in the Engraver, with whom he is here allied. Mr. William Holl has been worthily associated with him: he has evidently loved his task: the whole print is executed with masterly freedom, yet with such care; and the result of this union, is a publication of rare interest and value—considered not only as a SUBJECT, but as a work of Art.

PRINTING ON STUFFS, &C.

To the Editor of the Journal of the Photographic Society.

Seeing in the last number of your Journal that mention is made of an invention spoken of at Vienna, by means of which photography is applied to printing on silk and other fabrics, I beg to inform you that so early as the year 1839 and before photography had made scarcely the least progress, my attention had been directed to this subject, and I obtained sufficient impressions on silk, muslin, &c. to convince me it was worth the attention of manufacturers, and I accordingly (not having suffi-

ent time myself to devote to it) sent a communication to the Mechanic and Chemist, a useful but unostentatious publication at that time in existence, detailing an account of my experiments and forwarding specimens for inspection expecting it would be speedily taken up by others; such, however, was not the case, and it has remained in abeyance ever since; the paragraph before alluded to is the first idea of the kind I have seen.

I remain, Sir, yours respectfully,

W. H. HEWETT,

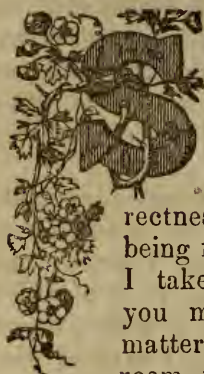
Yarmouth, Norfolk,
July 28, 1853.

Chemist.

From the Journal of the Photographic Society.

INSTRUCTIONS FOR TAKING STEREOSCOPIC PICTURES.

BY MR. G. S. WOOD.



SIR.—Having seen from time to time, both in your Journal, as also in others, “Rules for taking stereoscopic pictures,” and feeling satisfied of the incorrectness of such directions, from being founded on false premises, I take the liberty of forwarding you my own experience in the matter, which, if you can spare room for them in your Journal, I think may prove useful.

It would have formed a somewhat fitting introduction to my subject, to have shown wherein the writers of the articles above alluded to have erred, but as this course would, I have feared, have led me to have trespassed too much upon your space, I thought it well to come to my own plan at once.

In the first place, then, let us ask, What it is we have to effect in stereoscopic views? It is simply this: to form upon paper, or glass, or silver (according to the process we may be pursuing), two pictures of the object or objects precisely analogous to those which would be produced on the retinas of the eyes, were we viewing that object or those objects by direct unassisted vision; and the characteristics of those pictures severally should be, that the parts or objects composing such pictures should occupy different relative positions, because when viewing them in nature, we do so under different angles, or in other words, that lines drawn from the object or objects under consideration to either eye severally, would form different angles. And it is from the impression which is produced by what may be called the *unity* of these two pictures (doubtless in the brain,) that we at once have the sensation of rotundity or depth and thickness. And here I would remind those who may not be very conversant with the laws of vision, that the above remark may easily be proved by viewing an object or landscape with **one** eye only, for

then all sensations of depth, space and thickness vanishes, but upon opening the second eye everything stands out in its proper proportions. And I would also observe that the stereoscope has not, *strictly speaking*, any thing to do with producing impressions of which we have been speaking, but, as we have before stated, the relative positions of the objects viewed by the two eyes severally. The only use of the optical part of the instrument in question is, that by the aid of half lenses placed in a certain position, we may cause an extraordinary and oblique refraction of the images of the two pictures viewed, in order that they may be produced on those several parts of the retinas, which it should be borne in mind is indispensable in order to give distinct single vision.

What has to be done then in taking these pictures in this: after having decided upon the position whence our first view is to be taken, to notice, by a contrivance hereafter so to speak, which the objects composing the view undergo when viewed by either eye singly; of course keeping the head stationary during the observation, and moving the camera either to the right or left (as the case may be,) to such an amount that the objects composing the picture, produced on the focussing glass, shall occupy exactly the same relative positions as the objects themselves did when viewed with each eye *singly*, as before mentioned.

And thus after having stated the broad principles to be observed, I now come to what may more immediately be called the “modus operandi” of the whole affair.

After having placed my camera (I say camera, for I prefer only one) in a chosen position to take the first view, I place a piece of small wire (or a nail will answer all the purposes) in an orifice made to receive it at the top of the frame of the focussing-glass, so that it may project an inch or two *above* the frame, and having furnished myself with a staff or stick about 5 feet long, I force this into the ground about

6 inches or more from the front of the camera, and as near the centre as possible, without the light entering the lens being interfered with. We will suppose the principal portion of the view to be made up of a dwelling house, I place, say the right eye, about an inch or so from the wire on the top of the frame before mentioned, and closing the left, I now move the head to such a position that the wire and staff may cut each other, or in other words, that these two and the eye may be in a line, and notice carefully the part of the landscape whereon these conjointly fall; and we may for illustration sake say, that they are produced on the central bar of the left-hand window of the house. I then, without moving the head, open the left eye and close the right, and I now find that the staff has apparently altered its relative position; it now is produced, say on the extreme right-hand corner of the house itself. Having made these observations, I next note the particular part of the landscape falling upon the CENTRE of the ground-glass, and we will suppose this to be the right-hand of the doorway of the house. I now proceed to take my first picture.

Having done this, I move the camera so much to the left that the wire on the top of the camera and the staff, and the *right-hand corner* of the house may cut each other (as the two first-mentioned and the bar of the window did in the first observation,) at the same time observing that the right-hand corner of the doorway occupies the same position on the ground-glass as it did previous to taking the first picture. I need hardly add, that in either position the camera should be, at the same level.

It will at once be seen, that it takes infinitely longer to *describe* the course of procedure than the actually working it out; for the apparatus might be placed in its two positions, and the view taken, all within the space of a few minutes.

I may add, in conclusion, that where these rules are observed in taking stereoscopic pictures, of whatever character the view itself may partake, or however distant some of the objects composing such view may be, they will, when viewed through a stereoscope, convey to the mind impressions precisely corresponding to nature.

ON BROMENIZED COLLODION, BY M. LABORDE.

I have studied the action of bromides by themselves and in combination with collodion. My choice naturally fell upon those soluble in alcohol or ether, I have tried the bromides of iron, nickel, cadmium, zinc and mercury. The bromides of iron, nickel, and cadmium yielded the best results, and among these I give the preference to the bromide of cadmium. I have found it to possess so many advantages, that I have been several times tempted to banish all iodides from my preparations. 15 grains of bromide of cadmium added to 1½ ounces (by weight) of solution of collodion, gives a liquid which may be used at once, and which has been kept for about five months, up to the present time, without perceptible change. Sulphate of iron or pyrogalllic acid produces but a very middling effect; almost all the details of the image appear

at once, the effect of the weakest radiations becomes sensible; but the extreme tints of the proof are not sufficiently different to allow of being printed from with success. The following process is made use of to give them an actual value in this respect.

By adding a weak proportion of iodide of potassium to the bromide of cadmium the sensibility is increased, and we obtain at the same time a greater difference between the extreme tints of the proof, the negatives are therefore superior. The following are the proportions I usually employ:—

Bromide of cadmium.....	12 gr.
Iodide of potassium.....	0.3 gr.
Collodion.....	1½ oz.

At first the iodide of potassium tinges the collodion with yellowish red, but the bromide of cadmium by degrees removes this tint, and the solution become colorless.

Written for the Photographic Art-Journal.

CLEANING THE DAGUERRETYPE PLATE.

St. Paul, Min. Ter.

Oct. 1853.

R SNELLING—DEAR SIR.

Below I send a description of the things I use, in cleansing plates, hoping they may prove as useful to some of the readers of your Journal, who may wish to try them, as they

have to myself.

I use two bottles ; in one of which I put as follows, calling it No. 1 ; 2 ounces pure water, 2 ounces of alcohol and one dram of the muriate of iron, more or less, sufficient when well shaken up and dropped on a silver plate to stain it.

In No. 2 ; I use 3 1-2 ounces of pure alcohol and 1-2 ounce of strong aqua ammonia.

The muriate of iron is made as follows : take say one-half pound muriatic acid and saturate it with carbonate of iron, after it has settled, which will be in about 24 hours, pour off the clear part into a ground glass stoppered bottle and keep for use.

A few drops on a piece of flannel and spread on a gilded plate is most excellent to clean it with. The acid on iron combining with the gold and mercury turns it black and you have no difficulty in telling when the plate is freed from the film of gold.

I dust some rotten stone on my plate, and wet a piece of cotton flannel with No. 1, and after sufficient scouring, take a fresh piece of cotton moistened with No. 2. with which I scour the plate to an even grain and finish as usual. For the plates that have been gilded, I use a piece of cotton moistened with No. 1. and drop on the cotton a drop or two of the muriate of iron, and finish as above, always finishing with No. 2.

Any artist who will give it a fair trial will be well pleased with the result.

In galvanizing my plates I varnish the backs, (the enclosed picture is done so) - after a receipt published in your Photographic Art Journal, vol. vi. page 6. where a full description of the method may be found. The saving of silver, more particular on larger plates, to the artist is more than enough to pay the subscription to the Journal. It works well in every respect, neither injuring the silver solution in any manner nor obstructing the after process of gilding.

In applying the mercury to my plates, I use about 2 ounces, on which I pour 2 table spoonfuls of pure white sand, after its having been well washed and dried ; my reason for so doing is, it keeps the mercury out of contact with the air and perhaps more finely divided. The plan is well worth a trial ; it requires even a slight degree more heat or a longer exposure.

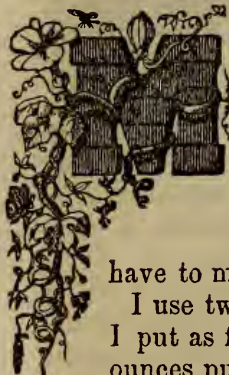
If the above should prove acceptable, I may at some future time, give a few observations I have made in my practice. I have written the above for the reason that I think that even an artist reads and is benefited by the experience of others, (as he is sure to be if he reads the Journal,) he ought in return to give his mite however small that might be.

The accompanying picture is one taken with a Harrison camera (quick worker); plate cleaned with olive oil, afterwards with No 1, and 2, to show you its effect—also showing the manner in which I mark my pictures good or indifferent, all that leave my hands. It is the copy of a scalp taken from a Chippewa brave, stretched on a hoop and ornamented for the occasion of a scalp dance, which was duly celebrated by the Sioux band, of Little Crow's village.

The picture I hope you will accept as representing a curiosity ; but am afraid will compare poorly by side of your city work.

I am yours, respectfully,

J. J. BARDWELL.



From the "Cosmos" April 17, 1853.

ON THE COMPOSITION OF THE SOLAR SPECTRUM.



THE recent researches of MM. Helmholtz and Bernard induce us once more thoroughly to discuss the ever controversial question of the intimate composition of the solar spectrum.

Sir David Brewster asserts absolutely,—1, that white light is composed solely of three elementary primitive and simple colors, red, yellow and blue; 2, that the solar spectrum, in whatever manner produced, is formed of three spectra of equal length, commencing and terminating at the same points, a red spectrum; 3, that all the colors of the spectrum are compound, and that each of them results from the superposition of three lights, yellow, red and blue, mixed in different proportions. These three lights are inseparable by the prism, because, according to Sir D. Brewster's hypothesis, they have the same refrangibility; therefore we can only hope to establish the fact of their existence by passing the compound tint through solid or liquid transparent media, which, by absorbing one or two of the simple rays and letting the others pass, would render the latter distinguishable. This in fact is the kind of demonstration tried by the learned Scotch philosopher. We will rapidly analyse the series of his reasonings. The object is to prove that at every point of the spectrum there really exists red, yellow and blue, and to isolate these three rays.

I. 1. *Simple inspection* of the colored spaces, he says, proves that the red light exists in the red, orange and violet of the spectrum: then since, according to Fraunhofer's measurements, these three divisions occupy 190 parts out of 360, the total length of the spectrum, the red rays are found in more than half the spectrum. 2. If we look at the blue and indigo through certain yellow liquids, olive oil, for instance, they acquire a very perceptible violet tint: then since the *violet contains red*, the blue and indigo contains it also. 3. It will presently be proved that white

light, which *necessarily contains red*, may be isolated from the green and yellow spaces: therefore red light exists in the seven colored spaces.

II. 1. The yellow color *shows itself distinctly to the eye* in the orange, and yellow and green, which occupy 77 parts of the spectrum. 2. If we look at the blue space through a green lamina of transparent gelatin, a whitish band will be seen to appear; then *since yellow exists in white light*, it exists also in the blue space. 3. Seen through olive oil, the indigo space takes a violet tint, because certain rays are absorbed; these absorbed rays cannot be red, neither are they white, *because white removed from indigo would not leave violet*; they are therefore a small portion of yellow, which, forming white with red and a portion of the blue, has the effect of weakening the predominant tint of indigo; therefore the yellow exists in the indigo space. Moreover, seen through a sufficiently thick solution of sulphate of copper and ammonia, the blue and indigo spaces appear *laves with white light, which contains yellow*; therefore these two spaces also contain it. 4. There remains the violet space, and Sir D. Brewster freely avows that he has not been able to prove the existence of yellow light there, because, he says, the intensity of the violet rays is so weak that it vanishes when it is subjected to the action of absorbents.

III. 1. It is evident to the eye that the blue light exists in the violet, indigo, blue and green spaces, which occupy 247 out of the 360 parts of the spectrum, that is to say, more than two-thirds. 2. Seen through a certain thickness of balsam of sulphur or red mica, the red space shows a green band, *necessarily composed of yellow and blue*; therefore the red space contains blue. 3. The orange and yellow spaces contain red, *and red contains blue*; therefore these two spaces also contain blue.

IV. The presence of white light in all parts of the spectrum may be proved; now *white light is necessarily composed of red, yellow and blue*; therefore red, yellow and blue exist in all parts of the spec

trum. 1. Seen through blue glass of a certain thickness, the spectrum only displays the yellow color; if the thickness of the glass is increased, this yellow acquires a pale tint like that of the monochromatic light of a spirit-lamp with salt in the alcohol, and finally becomes greenish white. 2. Seen through a mixture of solution of sulphate of copper and red ink, the yellow space displays only a slightly greenish white light. 3. By other processes of absorption the isolation of white light in the orange and green spaces has been effected.

These are the arguments which Sir David Brewster has brought forward in proof of his hypothesis. Are they really conclusive? Evidently not. We have italicized all the points in which the reasoning is defective; and if close attention be paid, it will be seen that the illustrious physicist supposes, every time, as incontestable, precisely that which it is the object to demonstrate. For example, he finds in a certain space green, in another white; now green contains blue, white contains yellow; therefore the first space contains blue, the second yellow. But why should not this green and this white be simple colors, why do they necessarily contain blue and yellow?

That is precisely the problem to be solved. "That is the question." And then who can tell what effect is produced in the absorption? This ought to have been established in the first place of all. Is the transmitted light the primitive light simply *strained*, which has lost some of the elements which by their mixture gave birth to it? The reasonings of Sir David Brewster require this, but he does not in any way prove that this is really what takes place. Is not the transmitted light, on the contrary, intrinsically modified; is it not even, as some physicists assert, a new light produced by a peculiar illumination of the absorbent medium, engendered by it? This is incontestably true, in certain cases at least, and it is for Sir David Brewster to prove the contrary.

In our opinion, then, the composition assigned to the solar spectrum by Sir David Brewster is by no means demonstrated; we do not regard it even as probable. From a philosophical point of view, this complex hypothesis of three spectra superimposed to form a single spectrum is altogether re-

pugnant; it could not have entered the mind of a partisan of the undulatory theory; it requires the vagueness and obscurity of the false system of emission to render it tolerable. Moreover, there exists an incontestable and striking fact which makes any belief in Sir David Brewster's hypothesis impossible. As every one knows, the spectra of a great number of flames are streaked with brilliant rays of every possible color, reds, oranges, yellows, greens, blues, indigos, violets, &c; now, without one single exception, these brilliant-colored rays always appear in the midst of the zone of the spectrum to which their tint brings them nearest, elsewhere. But if red existed, for example, over the whole extent of the spectrum, how is it that the red does not at least sometimes become sufficiently exalted to shine as a red ray in the midst of the blue, green, violet, &c.? Now this never occurs; therefore the red does not exist everywhere.

Lastly, the composition of the spectrum given by Newton is so philosophical that I cannot even comprehend how any one can have thought of opposing it. What can be more simple and more natural than this indefinite number of tints succeeding one to another in the order of their refrangibility?

We hasten to say, however, that in spite of the criticism of Messrs. Airy, Draper, Melloni, &c., we accept the brilliant collection of facts observed by Sir David Brewster as incontestable; we only deny the legitimacy of the reasoning of which they form the foundation, and the conclusions he draws from them. We regard them as good and beautiful experiments on absorption, full of interest. This white or greenish white light, isolated in the brilliant portion of the spectrum by the interposition of a cobalt-blue glass, and which was not decomposed when analysed by a large prism of great dispersive power, is one of the most curious facts of modern optics.

Another fact not less extraordinary, is that announced by Sir David Brewster in these terms: If we look at a very brilliant spectrum through a blue glass 42-1000ths of an inch in thickness, the extreme red portion of the spectrum is seen divided into two parts: one, the least refracted, forms a well-defined band of perfectly homoge-

neous red light, separated by a large black band from the second part, also red, perfectly homogenous, more refracted, and nevertheless of exactly identical tint with the first, less refracted, red band.

Some recent researches allow us to dissipate still more completely the doubts which Sir David Brewster's experiments might leave in some minds. In the first place we will refer to M. Helmholtz's observation.

1. It is to be feared that the eye receives, at the same time with the light of the spectrum which has traversed the prism or the colored substance, a certain amount of diffused white light, which affects all the phenomena. Indeed, however pure the material of the prism or the lens may be, and however well-worked we may suppose them, the interior and the surface of these transparent media always present irregularities, whence a sensible diffusion may result. This may be proved by allowing the sunlight to fall upon the prism or the lens in a darkened room, and placing the eye at the side of the direction of the rays regularly refracted: in this position, we then constantly see a certain number of brilliant points in the interior of the glass, and at the surface grains of dust and streaks.

2. The multiple reflections taking place on the different faces of the prism form another cause of error to be considered: to avoid the effect of these, it is requisite to blacken completely the two horizontal faces, and the vertical face opposite to the refringent angle.

3. The transparent lamina placed before the eyes acts absolutely like the prism and the lens. Moreover, if the two faces of this lamina are not perfectly parallel, the internal reflexions produce secondary images, which are not superimposed exactly over the principal spectrum, and which thus contribute to destroy the purity of the colors.

5. Finally, even when all these influences have been removed, we have still to fear the diffusion produced in the interior of the eye itself. Every one may perceive, that when he looks at a brilliant object, he sees a kind of more or less luminous halo around this object. For instance, if at night we place a light near a door opening into a less light-

ed room, the opening of the door will appear very unequally dark, according as the light is concealed or visible to the eye. In the same way, if we look at a black screen perforated by a hole admitting daylight, the aspect of the screen appears very different according as the hole is open or closed; if a colored glass is placed over the hole, the entire screen appears covered by a tint of the same color. The cellular or fibrous structure of transparent media, and the internal reflexions of the incident light, suffice to explain this phenomenon.

Admitting this, and taking into consideration these different circumstances the more extraordinary and embarrassing features of Sir David Brewster's experiments disappear. Looking at the yellow of the spectrum through a glass colored blue by oxide of cobalt, he says, we see a perfectly pure white, which must be regarded as undecomposable by the prism, since it is produced by rays which have been already decomposed by the first prism. Now, in looking at the yellow of the spectrum, the eye at the same time sees the neighboring colors; it sees them with an intensity differing little from the intensity they have in sunlight, while the yellow light is exceedingly weakened by the layer of blue glass. It hence follows that the small quantity of blue and red which, in consequence of various diffusions, may make an impression on the retina at the same point as the yellow, is sufficient to produce the impression of white by combining with the latter color. M. Helmholtz has adopted the following arrangement, to make the experiment in such a manner as to avoid all influence of diffusion: a solar spectrum is produced, in the usual manner, by means of a prism and a lens placed at a suitable distance from a narrow slit admitting the solar rays. The screen which receives the spectrum is itself perforated by a slit, which can be adjusted at will to any color; in this way is isolated a very slender luminous pencil, formed in great part of rays regularly refracted, and consequently homogeneous, but containing also a small portion of diffused light of various colors. This pencil is received on a second prism, to which succeeds a lens; the group of homogeneous rays throws upon a suitably adjusted screen, a narrow image of the slit, and the group of diffused rays forming a spectrum;

the purity of this image cannot be effected by it: as to the diffusions produced by the prism and the lens, the light they give is too little for its influence to be feared. By this means Sir David Brewster's experiments may be repeated on perfectly pure light: the results then obtained are found completely conformable to the ideas generally received. For example, pure yellow, seen through glass of any thickness whatsoever, always preserves its yellow tint, never passing into white.

Phenomena of contrast must have played as important a part as the phenomena of diffusion in Sir David Brewster's experiments. Thus when we look at the spectrum through a rather thick layer of a brown liquid, we see the red edged with a green tint, occupying the place of the orange yellow. This green tint can be only an effect of contrast; for in operating by the strict method just indicated, it is impossible to communicate a green tint to the orange or yellow. The violet color which blue takes when seen through a yellow liquid, such as olive oil, or the juice of *Coreopsis tinctoria*, is explicable in exactly the same manner; it is an effect of contrast due to the weakening of the blue rays in the vicinity of the scarcely at all weakened yellow rays. In all cases of this kind, it suffices to isolate the rays experimented on, to detect that their tint is not modified by absorption. Finally, it should be remarked, that if the spectrum is made very intense, the tints of the various colors appear to become mixed with white, and even to become slightly modified, the red invading the orange, and the green the yellow; this may give rise to appearances favorable to Sir David Brewster's theory. If the blue of a very intense spectrum is examined through a thick layer of ammoniacal solution of sulphate of copper, the color is seen to pass from whitish-blue to deep-blue; but this is only a modification of the physiological impression produced by the blue rays, a modification resulting from the weakening of the rays; and it is useless to suppose that the solution arrests differently-colored rays mixed with the blue of the spectrum.

M. Bernard, a physicist of Bordeaux, who took the absorption of light by un-

crystalized media for the subject of his "doctoral" thesis had, previously to M. Helmholtz, most carefully repeated Sir David Brewster's experiments, and he recognised that they might all be explained, without having recourse to the hypothesis of three simple spectra, by the two following principles, which might have been enounced *a priori*, and which observation fully confirms:—1, the intensity of the light has such influence on the sensation of color, that it may not only modify the aspect of the entire spectrum, but certain tints may disappear altogether; 2, the absorption produced by the action of media hitherto employed on the tints of the spectrum, only affects the intensity of the light, and does not influence the nature of colors. Whence it follows that,—3, far from destroying the bond which appears to exist between refrangibility and coloration, observations made with care tend to confirm the opposite opinion; everything, indeed, leads to the belief that to each ray of a given refrangibility, and possessing a determinate intensity, corresponds a color susceptible of being reproduced identically under like circumstances; 4, that, however, the refrangibility would not suffice to define the color, because two rays of the same refrangibility might give origin, according to their intensity, to the perception of different colors. M. Bernard clearly saw that white light, undecomposable by the prism, and which became colored under the action of absorbent glasses, had really a color of its own, which it manifested when the observer removed to a distance from the shutter, or when the intensity was diminished. He saw the dark band, which separated the two red spaces in the spectrum seen through blue glass, regain its original tint when the intensity of the light was sufficiently increased. The only fact still difficult to explain, is the decomposition or partial dispersion of the white band which Sir David Brewster rendered visible by absorption in the yellow space; but, may not the appearance of color in this white band, when seen through thin lamellæ of gelatin, arise from the diffusion of light produced by the want of polish of the gelatin, or other causes?

Written for the Photographic Art-Journal.

PEREGRINATIONS OF A WANDERER.



o these many days, "Wanderer" has withheld his valuable three cent goose quill from the heliographic columns of the "Photographic Art-Journal," and not now would he have seized upon the aforesaid three scented goose quill with the avidity and fervor of an inspired poet; but that Col. Turner on Monday last, grasped the dexter digits of Wanderer and exclaimed with all the sincerity of an honest lawyer, "Sir I am proud to make the acquaintance of the author of those articles!" I examined the expressive countenance of the Colonel for some slight evidence of what I conceived to be an ironical joke; but the legal look was on his face, and, being naturally of a credulous turn of mind, I very complacently succumbed to the Colonel's judgmental decision. Mr. Parks, also the cold water lyrist, is graciously pleased to say, that Wanderer's articles are "very pleasing and graphic pieces," and the gentleman who committed a portion of No. 3, of the "Peregrinations" to memory is a sublime gentleman, and a judge of the ridiculous besides. The Professors's testimony is to the effect, that Wanderer may be considered "an individual of the 'genus pumpkin' and an 'unquestionable' one too. And all this has grown out of the fact, that the "Photographic Art-Journal" is always lying in artful negligence upon the velvet lounge in the Skylight Gallery, of J. S. Park, the Auburn artist, and there, where ladies and gentlemen "most do congregate," the "Peregrinations" are read—by those who read them! What a shame and pity it is, that the young gentlemen loafers, ever to be found disgracing themselves and the towns where they reside, do not read more and learn more than they do, instead of loafing away their time in the back rooms of "stores," fiddling, playing cards and nigger-dancing. The contrast between the active, enterprising, valuable men of Auburn and the idle, loafing, ill-mannered fellows who lounge thereabouts

is as striking as the same state of things at Oak Bowery, only the latter place has an "uppercrust" that winks at the evil doing of the dregs; and the other difference is—the active, enterprising, valuable men of Oak Bowery are "as few and far between as angel's visits" or seraph's serenaders. There is a continuous moaning, and a voice of lamentation ever to be heard at the "Bowery." Tradition says a blind man lost a Picayune somewhere in the neighborhood of a carriage shop; every man in the town; but one, turned out and scramble for it, and, although one of them found it and claimed the whole of it, yet the "difficulty" was not settled until the picayune was divided into as many fractions as there were scramblers after it. The moaning and lamentation heard by night and day proceed from the ghost of the blind man, who claimed his fractional share of the picayune, but never got it. "Picayuneville" is about 12 miles from Auburn. The Auburn Masonic Female College is in a most flourishing condition at present, and deservedly so; with such a faculty it will command a patronage commensurate with its merits.

PRESIDENT LEE is not only a ripe scholar, but a gentleman and a christian in every sense of the word, and his many good qualities will always secure for him a lasting popularity.

PROFESSOR COBURN, in the department of Ancient Languages, Mathematics, &c., is all that could be expected in one man. He has no superior as an erudite christian gentleman.

REV. MR. JONES fills the measure of his calling to the brim, and no man could fill it fuller.

MISS WILLIAMS enjoys a reputation which but few lady-music teachers reach. Take it "all in all," the Auburn Female College is a complete and superior establishment, for the thorough education of females, and Wanderer, who is a judge of them (Colleges not females) pronounces it to be one of the best. The liberal citizens of Auburn contemplate building a College for the male portion of the rising Auburni-

ans, and to contemplate is to do, with them. The Daguerrean Institution is conducted by J. S. PARKS, an artist, a gentleman, a poet, and an ornament to the profession. His pictures are good enough for any place and the residents of Auburn have no occasion to go elsewhere for correct and well executed likenesses. When I first went to Auburn, I called in to see the Editor of the "Gazette," he was "out," as usual, and I concluded to wait awhile for him. Presently one of the "yours" looking out of the window exclaimed, "there he is!" Where? I asked. "There he goes in that buggy." Oh yes, said I, I see him; and then I immediately remarked that, it was very convenient to have a livery stables in town! The wags (all printers are wags) looked at each other and smiled, and one of them said "there is no livery stable in town Sir, that is Colonel Drake's buggy." "Oh yes," said I, "the Editor's brother." "No Sir, the Editor himself, owns the horse and buggy, Col. Drake himself is the Editor!" I was rather surprised as you may imagine and enjoyed the novelty of the thing, a great deal more when the "Devil" informed me that they all went out, generally, as the Colonel rode past, to enjoy the unusual sight of a country Editor riding in his own buggy. They look after him as far as they can see him, while he smiles in grim dissatisfaction at their dry waggery. Auburn is a place, and if it keeps on, it will become a "placer;" while "Picayuneville," always a "placer," in wealth, if it keeps on will dwindle down until it will lose its claim to a place on the map of the State. The little towns, make the most of them, are but little towns, and a city man with a soul expansive as the outstretched boundaries of a great metropolis, should never squeeze his enormity into the hide-bound limits of a diminutive village. Montgomery is a place where a man can "live, move, and have his being," with some comfort—his "area of freedom" is not confined to the limits of a "pent up Utica," and let his principles and sentiments be as peculiar as they may, he will always find some few liberal souls who can forgive him his idiosyncracies even though they cannot endorse them. Unless a man has a fortune to back him up withal, he manifests a great lack of policy (as the world is) in publishing his opinions—he

had better go along "dry so" and "rake in the dimes"—until a more convenient season," and the means will enable him to carry out his views.

The readers of the Photographic Art-Journal will please excuse Wanderer for his Peregrinations with odd ends of irrelevant cogitations, but the fact of it is, his speculations like his habitations are more singular and varied than a soldier's "rations."

Coming back to daguerrean subjects, I find Mr. McIntire in entire possession of the city as a daguerreotypist. Well, Mr. McIntire can supply all demands in the most satisfactory manner—he is an excellent artist and an amiable gentleman.

Mr. Frear is sojourning in the purer air of West Point until "Jack Frost" shall have mercifully destroyed with his "cold steel" his great antagonist "Yellow Jack." Mr. Frear's spacious and well ordered Gallery will be a feature and an ornament to Montgomery, and he is the man to set it off to the best advantage. His greatest virtue (greatest *fault* as the world goes) is his princely nature, which impels him onward to the most generous acts and liberal benizens, &c. &c. But this is no place for a daguerreotype of *character*, and I restrain my most willing hand from what might be called a too flattering likeness of a true man.

I have not seen the Journal, for many a month until lately, at Mr. Park's gallery in Auburn. The Editor continues pertinaciously to send it away off to Spartansburg in South Carolina, where I have not been since I left Mose there over a year ago. I wonder what he means by writing letters to me at Montgomery, and sending the Journal to Spartansburg. I never did know an Editor that was'nt a "queer Dick" or a queer Henry.

Montgomery, WANDERER.
Oct. 29, 1853.

NOTE.—None of that, Mr. Wanderer, if you please. We directed the proper change to be made, upon the reception of your first letter to that effect, and we were perfectly innocent of all knowledge of the fact stated until now. We have often wondered at your silence, and had about made up our mind to give you a touch of the

"Old Harry," but you have just saved your "bacon," and we trust Fre(a)er dispensations and Park's artillery will keep you to terms.

Wanderer—cease not, your toils' not o'er—
Write again, Oh, write! to us once more.

There is rhyme and reason in two lines, impromptu, from memory.—Now, take your goose-quill and stick a feather in your cap, and when you visit our office you shall have some *pi*. Just look at our prospectus for 1854, and give us a descriptive article for the first number, illustrated by our friends, Park & Frear. We are going ahead, we are, and we want you to set the daguerreotype world in a phrenzy of delight and emulation. We want to give them a "Journal as is a Journal," and we want *all* to help us. A (h)editor is a "queer Dick," cause why, he is always expecting queries and is delighted when he answers the purpose—therefore, what he does, he does "a purpose." When he asks folk to write for him he means it, because it is the *means* by which he lives and they profit, although there is nothing *mean* about the whole *matter*, except the *matter* of *form*,

which should be well *condensed* and *formed* to *meet* the understanding, *furnishing meat* for the mind and food for the body, and producing a mine of wealth to all who may delve into the rock of knowledge—a *ledge* that never *gives way*, though ever so much undermined by the waters of *ignorance*, or overlaid by strata of intellectual pressure, but grows upon what it feeds, adding layer upon layer until it lays up for its possessor immortality, places *** upon his escutcheon, *composes* his dying hours, *coins* for him a name, and makes him a *type* to be *set up* as an example to be followed by future generations. Now, are you answered, Mr. Wanderer? If you are not, just drop us a line and we'll take the bate, as the fish said to the angler. Speaking of anglers, reminds us of the many angleworms that are mixed up with the glow-worms in the daguerrean art and that serve to catch gudgeons only—but *au revoir*, catching gudgeons always was and always will be a profitable business, if they are used only to manure the barren soil of the field of knowledge. *Editor.*

From the London Art-Journal.

THE CARDINAL'S PICTURE BY TINTORETTO.



T is no visionary idea that scenes and sights, persons and pictures, make an impression, and force themselves into the mind and memory in early years, in a manner that they never do later in life. The first days that I beheld enchanting Italy now haunt me, and so worked and engraved into the memory are those days, that trifles, foolish, silly trifles, are ⁿever lost sight of after in the midst of

the graver events of life: baskets of flowers seen at Florence and at Genoa. the look of rooms, the tones and noises of bells and a peculiar sound that the carrriages make rolling along the flat pavement of the narrow streets in Italy, when turning into the porte-cochères of the palaces and hotels. So true is it that sounds and sights imprint themselves on the brain or on the memory, much more than great events. The child remarks and remembers the fly on the book, and is more occupied with that fly, than with all else

within the room. After a long lapse of years, I now see before me the manner in which the festoons of *Rosa multiflora* fell about the windows of the apartment we occupied at Milan, in luxurious festoons of bunches of varied hues of pink flowers, that covered one entire side of a large court of the Albergo Reale filled with orange trees.

The weather was delicious. It was a warm month of September, and the descent from the Simplon had been a successive scene of splendor in scenery and vegetation, of the whole plains of Turkish wheat, of vineyards and olive groves, the people singing gaily while gathering in the vintage under the hot sun, the white oxen bringing home the heavy laden barrels to the wine-presses; but we had not arrived at Milan without mixed feeling of uneasiness and fear, for the brigands were about the country on the look-out for travelers. Mr. H.'s courier was shot at and robbed, and the *Sbirri* being in pursuit of those whom the country people called the "*cattivi gente*," we were recommended to make the best of our way from the Isola Bella before the banditti had time to reassemble.

At Milan, then, we arrived, and were rejoiced to arrive safely. The guitars under the windows were played by moonlight, and accompanied voices that sung the popular ballads of those times. "*Bella Nice*," and "*Ti amo*," and "*Addio, mio caro*," mingled with the sound of the perpetual ringing of different toned bells, the noise of carriages, and cries of "*aqua fresca*;" a new page or turning over of the book of life had begun for us.

The next day our good friend R. came to accompany us to the sights of Milan. I was too young to care for any parchments, or dogmas, or antiquities, but beautiful flowers, well-spoken words, or a graceful figure, found a place directly in my head and heart. We went to the Ambrosian Library. Of all the curiosities there amassed, the only thing that made any impression upon me was a lock of fair hair, along with some love-letters in Italian and Spanish, preserved altogether. Some of the love-letters were folded in the form of notes, and addressed, "*Al mio carissimo*." I enquired to whom they had belonged, and was answered that the hair was the hair of a very wicked woman, and that the

letters that accompanied it were hers, and those of a cardinal who had been her lover. The letters as well as the explanation made a great impression upon me. How the hair could have been preserved in such beauty above four hundred years—how it could be worth while to preserve a lock of fair hair four hundred years—how such beautiful golden locks could have belonged to a very wicked woman—and, above all how a woman with such locks could have had an old cardinal for a lover—was so contrary to all my ideas of love and romance, that I did not lose sight of the subject for a long while. I remember all that passed the remainder of that day: returning to the hotel, we dressed, dined, and went to the Scala, and, as we went to the opera R. repeated to us Petrarch's letter that is kept in the Virgil that had been his, in the Ambrosian Library. Petrarch, in this letter, writes an account of his first beholding Laura, which he says he places in his Virgil because it is the most precious book he possesses, and the one that he opens the oftenest. The letter is at once so simple and so pathetic that it will bear the plain words not only of English truth, but of literal translation. The termination of Petrarch's MS. writing states, "*that now all happiness is fled for ever, Laura being returned to that heaven from whence she came*." I well remember the sound of the wheels of the carriage, a dull sort of heavy sound over the flat pavement of Milan and my anxiety not to lose a word of what R. was telling us.

It was a gala night—the Emperor of Austria's birth-day—and the theatre was illuminated as bright as day, and not left, as it was on ordinary nights, to its illuminated clock, and to the partial lighting up of boxes of persons playing at cards during the intervals between the songs and dances. The pit was filled with the military in their superb white and scarlet uniforms, and in the boxes were some of my own handsome countrywomen; Mrs. H. at the height of her beauty, now old and ugly; among others, the Milanese beauty, Madame Falconnieri, was pointed out for us to admire. She was a blonde, and wore in her hair a *soupeon* of powder—a fashion that some of the ladies of the courts of Napoleon and Murat had introduced some years previously to this time; the powder

was blown, as it were, on *crepe* curls. I never saw but her and the Princess Bagral, tion who managed this mere idea of powder successfully, and it was very pretty, giving a soft and *kittenish* expression to the whole countenance.

In the opera box our learned or silly visitors, discussed or differed on the subjects that travelers or foreigners would naturally talk about in an opera box:—the ballets, the Austrian government, the *carcere duro*, Guercino's picture of Agar, the jewellers' gold shops, San Carlo Borromeo, Pasta, Virgil, Petrarch, the color of Laura's eyes; what was the powder that Madame Falconnieri wore in her hair?—the smell of the yellow cassia-flower, now in bloom, agreed to be unlike any other perfume in the world;—all these subjects were severally talked of on that gala-night but the story that ran in my head, the history I wished to know, that of the lock of hair, was never once alluded to, and on my timidly naming it, it seemed to interest no one but myself. For a long time my ideas of Milan and the lock of hair were one and the same; at last, time brought out what the Americans term a *reciprocate*. Soon after, Mr. Moore, published the Life of Lord Byron. It then appeared that the imagination of the poet had been struck just as mine was, by a *something* indescribable, in the look of the letters and the lock of hair. Lord Byron says:—"I have poured over the letters and the lock of hair, the prettiest and fairest hair imaginable—I never saw fairer; and go repeatedly to read the epistles over and over and if I can obtain some of the hair by fair means, I shall try. I have already persuaded the librarian to promise me copies of the letters, and I hope he will not disappoint me." It seems that Lord Byron felt more interest in these letters, than he did in any remains of the *cinque cento*, or of the Fine Arts at Milan.

Time passed on and I ceased to think of the far from immaculate lady, or of the letters at Milan, until they were brought forcibly to my recollection by a picture in one of the public galleries of Italy. I was much struck by a painting by Pintoretto, which, although it neither represented beauty, goodness, youth, wickedness, nor feeling, had a certain shrewdness very rarely given in painting. It was a portrait of a

man between fifty and sixty years of age, in the dress of a cardinal; a drapery, which is half raised, exhibits a distant landscape; the attitude of the figure is of the deep in thought; the eyes, so shrewd in expression, look worn by intense application to earthly, not to heavenly matters. He appears to be more as if he were solving a problem in politics, than thinking of the contents of the books of prayer which he holds in his hand, which evidently does not form any part of his meditations. His beard is long and grey, and the scrutinising expression of his countenance takes away all dignity. This was the lover of the lady of the fair locks, and the writer and receiver of the letters now at Milan. This picture was the portrait of the greatest man of his time in Europe—the Cardinal *par eminence*; the most distinguished and universal scholar and politician in Italy; the best historian and the most eloquent speaker of those days; supposed to be the best Latin poet, and also an Italian and a Spanish poet.

Cardinal Bembo was a patrician of Venice, an ambassador to the court of France, an ambassador from Rome to the republic of Venice, the favorite of two successive popes, Leo X., and Paul III.; the friend of Ariosto, who wrote his "Orlando Furioso" upon his counsel; the friend both of Raphael and of Titian—employed by Leo X. to persuade Titian to devote his great genius to the papal court of the Medici at Rome—at that same time that Francis I. was negotiating to gain both Titian and Leonarda da Vinci to reside at the court of France.

Like the hero of the French vaudeville.

Il fait tout, il voit tout,
Il sait tout--et partout.

One moment he is heard of erecting a monument to the memory of Dante; the next receiving the adulation of the Venetian senators on his eloquence in the senate of the republic; then drinking chocolate, according to the new fashion introduced from Spain, in vogue at Madrid, with the beauties and learned ladies of those days, Elizabeth, Duchess d'Urbino, and Madamma Emilia Pia; writing Raphael's epitaph in the Pantheon at Rome,—that same epitaph that served Pope in the eighteenth century as the model for his fulsome epitaph on Sir Godfrey Kneller in Westminster Abbey,—hearing the "Orlan-

do Furioso" read to him while surrounded by his dependents, and as the sages of those days write, "emulating Virgil or Cicero in his compositions, and from the fervency and eloquence of his style, a second Petrarch in his sonnets."

Bembo was the devoted admirer, friend, and adviser of the high-born ladies of his day,—two of these ladies were celebrated all over Italy for their accomplishments and knowledge: one was Vittoria Colonna, the widow of Davalos, Marquis de Pescara,—he who won the battle of Pavia, and bore a great name in the history of Europe. She addressed sonnets to the Cardinal, in which she excuses herself for the making her love for her husband the theme of her verse; and this she may have written in the fear of his taking them to himself without the excuses.

The portrait painted by Michael Angelo, and finished by Venusti his scholar, which was in the Cammucini collection at Rome, did not represent Vittoria as the piece of earthly beauty as well as of divine perfection she has always been thought; it may have been painted when grief, and care, and religious austerities, had obliterated all traces of grace or beauty,—but in those days,

Friends in all the aged she found,
And lovers in the young

In her list of admirers, besides Bembo, are Ariosto, Bernardo Tasso, Michael Angelo and the English Cardinal, Reginald Pole, banished to Italy at the dawn of the Reformation. Another of the Cardinal's platonic friends and pupils, was the Lady Veronica Gambara, Countess of Correggio, whose poetry is to be found in Mr. Mathias's collection. She attributed her love of learning to his instructions and advice.

The noble ladies of Italy of those days were as different from the modern Italians, as are the English ladies of the reign of Queen Victoria from those of Elizabeth; strong of purpose, religious, passionate to excess, and high-minded, many of them had what Bossuet calls *une ame toute royale*! Affection was not then, nor is it now, in the character of the Italian women; either a deep or a strong passion engrossed them, or they turned their minds with passion to something,—to religion, to learning, or to Art; so that the vanities and prettinesses of life were banished for

want of room to flourish in. Such characters were Virginia Accoromboni, Titan's scholar; Irene di Spilemborgo, and many others. When heiresses, they often received an education that would have made them doctors-at-law; and like Shakspeare's Portia, young, rich, learned, and beautiful, many of them might have pleaded a cause, and gained a law-suit in any court. The lady of Correggio was one of those females, whose birth was ennobled by learning. In the simple grandeur of almost royal widowhood, she lived in her palace of Correggio, a palace decorated by the painter, then called Allegri now known as Correggio. In that residence she educated her sons, and held a sort of academy for the learned, which drew the attention of the Emperor Charles V., at the time that he was crowned Emperor at Bologna. He went twice to Correggio to visit the Countess, created her a princess, and received her afterwards as a royal person at Bologna. It is said that she was coarse-looking and ugly; but that a natural eloquence gave to her conversation a charm that won the great Emperor's heart, and all other hearts besides that of the Emperor.

From all these learned ladies, Cardinal Bembo, received by the *proccacio* of Italy, the slow and tardy post, letters; some wrote of love, some wrote of hate, some of learning, and some of religion. The Cardinal broke the tiny piece of silk by which the armorial bearings, or the adopted motto of the lady's seal, was attached to her letter. He thus answered the Italian lady:—

'What's done in the Capital; who's like to rise!
Who thrives: and who declines side factions, and
gives
Conjectural marriages; making parties strong;
And feebling such, as stand not in *their* liking!"

These too were the days of Machiavilism.

Cardinal Bembo was in servitude, as it was termed, during fifteen years of his life, to her of the fair locks, at Milan,—that is to Lucrezia Borgia, the wife of Alphonso I., Duke of Ferrara. Mr. Roscoe has attempted to rescue the fame of this lady, which he would willingly prove as fair as her glossy curls; indeed, it is difficult to reconcile with the name, the character that historians give of her as Duchess of Ferrara, whose beauty and talents were sung by many poets, and whose picture

is seen represented by Titian, as a shy, retiring, and very beautiful woman, along with her husband and child, in the gallery of Dresden.

Bembo died in Rome, and is interred in the church of Santa Maria sopra Minerva, an edifice belonging to the order of Dominicans, where sleep Leo X., Cardinal Howard, and a host of popes and cardinals. But to have done. In the ancient church of St. Anthony, at Padua, called Il Santo, beautiful in its antiquity, picturesque in its gloom, surrounded by superstitious associations, and tremendous in its recollections of a terrible machinery of religion in Italy; surrounded by the bronzes of Donatello, marbles, pictures, frescoes, and a variety of decoration, rivalled (to the artist) by San Francesco d'Assisi, amid *ex-votos* innumerable, and lamps which throw here and there a light on the distant objects almost forgotten in the shade,—in the middle of this beautiful old church, on the third column to the right, is a monument to the memory of Cardinal Bembo; his portrait is upon it in bas-relief, sculptured by Ca-

taneo. It is of this portrait on the monument, that Goethe remarked when he saw it, (in French,) that it had the air of a man, *fortement concentre en lui-meme* (very full of himself). Tintoretto's portrait gives that impression of his character. When sitting to Tintoretto, he was evidently disentangling some political web in his own mind, relating to his own fortunes.

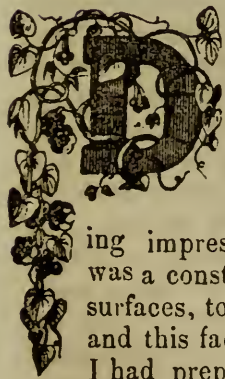
Cardinal Bembo, the man of success of his day and times, was one of those artificial made-up characters, that somehow or other always displease posterity. His star of reputation shone on himself, and set with himself; while the stars of many rise but after death, as in the case of Shakspeare, Milton, Shelley, &c. &c. These were men of genius; while Bembo, so regarded, consulted, looked up to, and flattered by his contemporaries, was mostly made-up of acquired learning, pedantry, pretensions, and affectation.

Those were his precious stones, which he placed in a magnificent setting of pride and vanity, that drew the eyes of the world upon him.

From the Journal of the Photographic Society.

A NEW MODE OF CONDUCTING THE DAGUERRETYPE PROCESS.

BY W. H. STANLEY CRAWFORD.



URING the course of numerous experiments in the daguerreotype art, I found that after plates were prepared in the usual way with the vapors of iodine and bromine, ready for being impressed in the camera, there was a constant evaporation from their surfaces, to a greater or less extent; and this fact was most marked when I had prepared plates for views, &c., but which could not be used till several hours afterwards; in the latter case, the bromine, more volatile than the iodine, had evaporated more rapidly, and conse-

quently the proportions between the two—so necessary for a good picture—were entirely destroyed. Another circumstance that struck me was, that if a plate were prepared well, and allowed to remain in the dark box a few minutes ere placing it in the Camera, the resulting impression was always more sharply and better defined than if the plate had been immediately used; in the latter case, the impression being not unfrequently somewhat clouded in detail. These observations led me to the conclusion, that when under the ordinary process a plate was exposed in the camera, and the actinic rays allowed to act on its sensitive surface, the evaporation (above

alluded to) being let loose in the camera, the vapors again attacked those portions of the surface affected by the actinic agency, and so prolonged the operation; for it is well known that the mixed vapors, so long as they exist, will if allowed to fall on the plate, altogether neutralize the effect of the actinic power. I hereupon set about thinking of some plan to remedy the defect, and eventually determined to allow the plate to be acted upon *simultaneously* by the *actinic ray* and the *vapor of mercury* or *light transmitted by means of a yellow medium*, and the result quite bore out my expectation.

Having no apparatus for carrying out my views neatly, I was put to make shift the best way I could, and I did thus: An ordinary camera was placed before the object to be taken, the focus nicely adjusted, and, immediately before inserting the dark box with the prepared plate, a thick cast iron cup, filled with mercury, was heated to the usual degree, and placed inside the camera; the slide of the dark box was then withdrawn, and the plate exposed by uncovering the lens. Pictures, by these means, were taken in a fraction of a second, giving a gain in time of, say in the ratio of one in five seconds over the ordinary way; the details were most sharply and beautifully delineated, and the pictures very firmly set on the plate, so much so, as to give much trouble to clean, even before subjected to the fixing process. It will of course be understood, that, although the picture was taken in a fraction of a second, the plate had to remain at least five minutes afterwards in the camera, the point gained being simply that the parts affected by the actinic influence were immediately acted upon by the vapor of mercury, and thereby prevented from re-absorbing any of the loose vapors, and thus the resulting picture was not only expedited, but much improved.

I have now constructed a camera which simplifies the operation much, and which for a traveling daguerreotypist is a great improvement, as it does away with the necessity of a mercury box, and saves all the time and trouble of changing the plate from one box to another, pouring and repouring the mercury, &c. It is formed thus: A, fig. 1, is the usual form of the camera, showing a back view. B is a cast

iron bottle of the capacity (for mercury) of say 3 or 4 ounces, and screwed in a convenient place, on about the centre of the hinder or sliding part of the camera; and

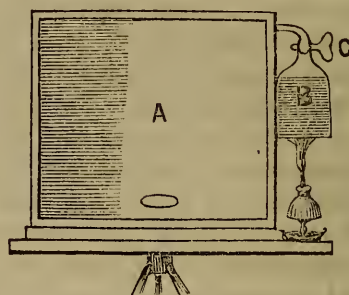


Fig. 1.

C is a close-fitting cock, to shut off or to allow to escape the mercurial fumes when

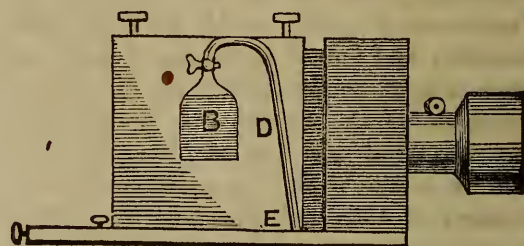


Fig. 2.

heated. Fig. 2, D, is a pipe, say of metal, bent from the upper part close to the side of the camera, and leading inside by a close fitting aperture, E. The working must now be obvious; the bottle, B, is placed rather well upon the side of the camera, to allow of its being conveniently heated with a spirit-lamp.

I have found the same results effected by admitting *light* into the camera through a yellow medium; but as this can only be done in a *strong light*, it would not be of such general use as the preceding plan.

I may mention here, that I am one of those who hold that it is the *color of the vapor* (yellow) of mercury which develops the latent picture on the plate, and not particles of mercury attaching themselves to the silver, as some affirm. The sun's rays, through a yellow or orange medium, act precisely in the same manner; but I cannot now enter upon my reasons, as it would occupy too much space and too much of your valuable time.—With regard to the process that I have now communicated, it may be suggested that the mercurial vapor would injure, or, at all events, not improve the back lens,

upon which, of course, it must of necessity fall in cameras constructed upon the present plan, though hitherto I have not found my lens affected at all; but to

obviate any risk of such damage, the camera should have an air-tight partition of clear blue glass immediately in rear of the lens. W. H. STANLEY CRAWFORD.

From the Jour. of the Phot. Soc.

ON THE SENSITIVENESS OF BROMIDE AND IODIDE OF SILVER TO COLORED LIGHT.

BY W. CROOKES.



IN a paper by Sir John Herschel, printed in No. 6 of this Journal, entitled, "On the substitution of bromine for iodine in photographic processes," he mentions the superior sensitiveness to colored light which bromide of silver possesses over the iodide, and refers to his experiments on this subject, as a proof that for camera pictures, in order to obtain a true artistic representation of the relative intensities of light and shade, iodine must be entirely given up, or at least limited in its use, and its place supplied by bromine. On referring, however, to Sir John Herschel's former paper; we find the following description of the effect of the spectrum on a paper prepared with bromide of silver:—"The action commences, *the moment the rays fall upon it*, visibly over its whole length, and is uniform in intensity at every point except just at the extremities, where of course it fades gradually." Now this effect was produced without any after application of a reducing agent, while in a camera picture the first effect of the light is generally invisible, requiring an after development to render it visible. It becomes, therefore, of the utmost importance to ascertain by experiment whether those luminous rays of the spectrum, which by a comparatively long action will produce a visible darkening on a sensitive surface, are also capable in a shorter time of causing the same sensitive surface to blacken under the influence of a reducing agent. The

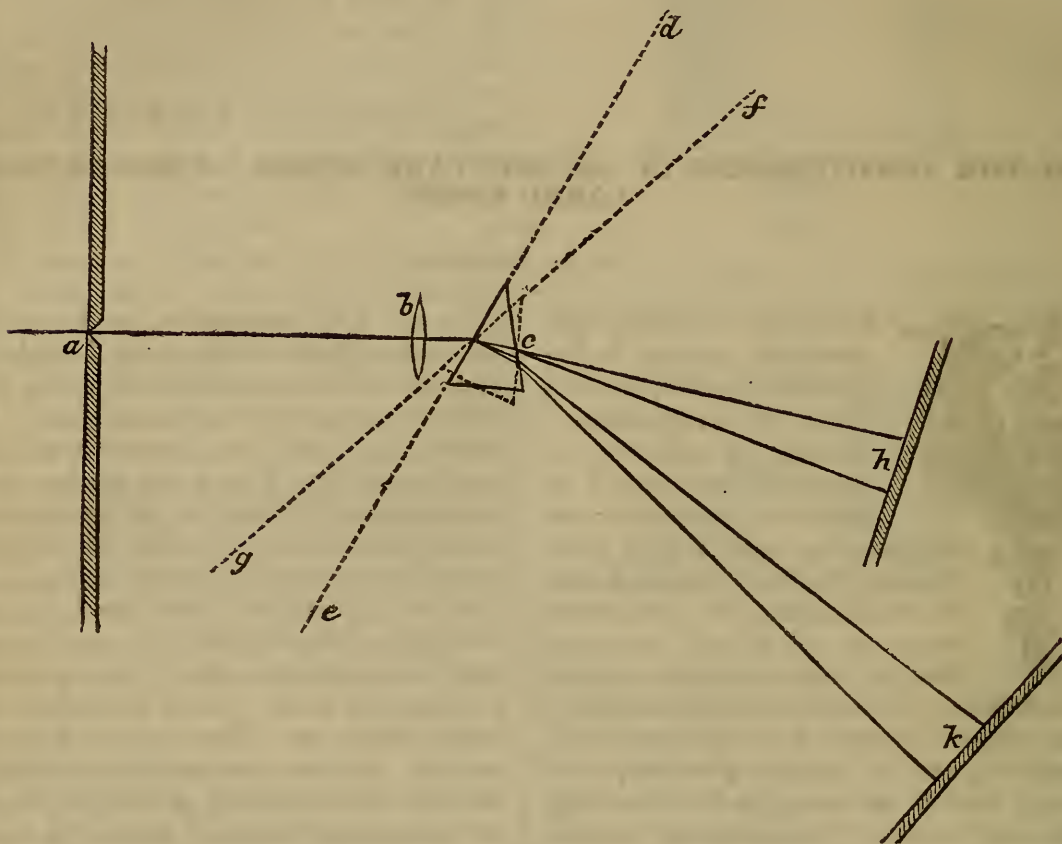
following experiments were made in order to satisfy myself on this point, and also to clear up several anomalies I had met with while working with colored objects. As others may wish to experiment with the solar spectrum, I may be saving them some trouble if I describe the arrangement I have found most convenient for obtaining a solar spectrum of tolerable purity.

A ray of sunlight is allowed to pass through a fine vertical slit, *a*, of about 0.02 of an inch wide and 1 inch long, into a darkened room. At a distance of 24 inches from the slit a lens, *b*, is placed, and an inch or two behind it a prism, *c*, with its refracting edge parallel to the slit *a*, and arranged so as to allow of a movement in the direction *d, e* to *f, g*. The lens, *b*, should be 12 inches focal length, and a little more than 1 inch diameter. I have found a spectacle-glass answer very well for ordinary purposes, though the fixed lines are rather better seen with an achromatic lens. When the prism is placed, as at *d, e*, so that the least refracted form a straight line, the focus of the spectrum (if I may so term it) in which the fixed lines are seen with the greatest distinctness, will be between 2 and 3 feet from the lens at *h*, but as the prism is moved towards the position *f, g*, the focus is towards *k*, and the spectrum correspondingly increased in size. It may thus be obtained of any convenient length from 1½ inch up to 8 inches or more, measuring from the fixed line B to H. It will be found very convenient to wash the card used for focusing with a weak solution of sulphate of quinine, thus rendering visible the lines above H.

It is generally supposed that Fraunhofer's lines are only to be obtained by using the very best prisms; doubtless the finer ones can only be seen in perfection by this means, but I have always been able to count more than a dozen with every prism

I have tried,—even with the cheap ones sold in the toy shops. The one I have principally employed has been a Munich prism, kindly lent to me by Professor Wheatstone.

The fixed lines which I have copied on



the collodion plate, correspond exactly with the map given by Professor Stokes in his paper (Phil. Trans. 1852 part 2, page 476.) To refer to a point not corresponding with one of these lines I shall adopt the method given by him in the above paper, article 24. I cannot describe it better than in his own words.

"The position of a point in the spectrum which does not coincide with one of the principal fixed lines, will be denoted by referring it to two of those lines, in a manner which will be most easily explained by an example. Thus $\frac{1}{2}Gh$, $G\frac{1}{2}H$, $Gh\frac{1}{2}$ will be used to denote respectively a point situated at a distance below G equal to half the interval from G to H , a point midway between G and H , and a point situated at the same distance above H . In using this notation, the letters denoting fixed lines will be written in the order of

refrangibility, and the fractional expressing the part of the interval between these lines, which must be conceived to be measured off in order to reach the point whose position it is required to express, will be written before, between, or after the letters, according as the measurement is to be taken from the first line in the negative direction, from the first line in the positive direction, or from the second line in the positive direction, being that of increasing refrangibility."

As spectrum experiments to be of any value must be of such a character as will admit of an easy verification or comparison with the results of other experimentalists, it is important to know whether the sensitive substance under examination is affected differently by the various rays of the spectrum according to the matter with which it is associated. My first object was to as-

certain whether this were the case or not, and also to see if an analogous result could be obtained by any variation in the strength of the solution, length of exposure, or difference in the developing solution. It would take up too much space were I to describe separately the numerous comparative experiments I have made between bromide and iodide of silver. They have been prepared on different kinds of paper by most of the published processes, and with iodizing or bromizing baths containing complicated organic mixtures; the sensitiveness of the paper has been lessened by washing and keeping; the development, where the process would allow of it, has been carried on for more than a day; collodion prepared by different methods has been used; the time of exposure has been greatly varied (in the case of collodion from one second to ten minutes;) and pyrogallie and gallic acids, and protonitrate of iron, have been alternately used for developing, but the result has been in every case the same. When iodide of silver is exposed to a pure spectrum for a space of time not sufficient to darken it visibly, and then brought out by a developing agent, it is only affected by the rays more refrangible than 1-6GH, forming the indigo, violet and invisible parts of the spectrum, the maximum effect being between 1-6GH and HkI, comprising the indigo and the lower two-thirds of the violet. Once or twice, after a very long exposure, I thought I could perceive an indication of action as low as 1-2GH; but this was probably owing to light being diffused from the neighbouring strongly-acting space around G. The photographic intensity of the extreme rays from *m* upwards is very small; so that, supposing an effect to be produced in one second by the rays from 1-6GH to *m*, it would require perhaps ten seconds for the rays between *m* and *n* to produce an effect, while those from *n* to *p* would hardly give evidence of their presence under twenty-seconds' exposure. The absolute sensitiveness of the iodide of silver of course varied in every case; but the relative sensitiveness to the various rays never altered.

Having obtained a definite limit of sensitiveness of the iodide of silver, independent of any matter which might have been associated with it, I repeated the whole of the experiments with bromine in

the place of iodine, and afterwards with a mixture of the two. I confess I was surprised on copying the spectrum for the first time on bromide of silver, to find how very little superior it was to the iodide in its sensitiveness to the luminous rays. I was at first inclined to ascribe it to some accident, until every fresh experiment I made confirmed the former one. The result in this case shows as conclusively as in the case of the iodide, the existence of a definite boundary line of action, the darkening being produced only by the rays above the band *b* (between E and F), forming three-quarters of the green, together with the blue, indigo, violet and invisible spaces, the maximum being between *b* and HkI, comprising three quarters of the green, the blue, indigo and two-thirds of the violet.

When I employed a mixture of bromide and iodide of silver as the sensitive surface to receive the spectrum, I obtained a mixed effect, the iodide being acted upon from 1-6GH upwards, and the bromide from *b* upwards, the action between *b* and 1-6GH being due solely to the bromide. On paper this had a very curious appearance, the iodide spectrum being an opaque black, and the lower extremity of the bromide spectrum projecting beyond this being only semi-opaque, and of a reddish color. A variation in the proportions of bromide and iodide only produced a corresponding difference in the relative intensities of the two spectra.

I have tried in vain to obtain a visible action on the sensitive surface before developing similar to the experiments of Sir John Herschel, but the intensity of the spectrum has been too weak, and the motion of the sun has prevented the exposure being sufficiently long.

My next step was to ascertain what effect would be produced by a spectrum, having previously submitted the beam of light to the absorbing action of sulphate of quinine. For this purpose, a cell with a solution of sulphate of quinine, containing 25 per cent. and placed across the beam of sunlight between *a* and *b* in (in figure); this intercepted the rays more refrangible than G1-4H, limiting the action in the case of iodide of silver to a narrow line between 1-6GH and G1-4H, (about the centre of the indigo,) and in the case of bromide of silver to the space between *b*

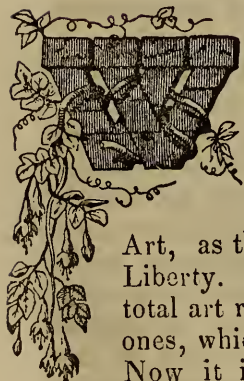
and G1 4H, comprising about 3-4 of the green, the blue, and 3-4 of the indigo.

These experiments, far from explaining several results obtained when working with colored natural objects, seemed rather to be in direct contradiction to them. Taking it for granted that bromide of silver was sensitive to red and yellow light, I was not surprised to see such flowers as the scarlet geranium, eschscholtzia, dark red verberna and others produce a strong effect when copied on bromide of silver behind quinine, but I could not understand why I sometimes obtained an effect from them on iodide of silver. Now, however, it became evident that the color had nothing to do with the photographic action, this being necessarily due to the green, blue, indigo or invisible rays. On carefully analysing with a prism the light reflected from variously colored flowers, it proved to be far from homogeneous, there being in every case sufficient of the visible active rays present to produce an image even on iodide of silver.

It is a well-known fact among photographers, that with iodide of silver (and this holds good also with bromide,) after a certain time of exposure in the camera has elapsed, a further increase in the time does

not produce a corresponding increase in the photographic action of a strong light, but does so with a weak light. Now since all the colored objects that I have examined contain some of the rays capable of affecting iodide of silver, it ought to be possible, by increasing the time of exposure and varying the strength of the developing solution, to obtain without a quinine bath a photographic effect from colored objects more nearly approaching that which would be given by an engraving of the same. This is, in fact, a plan which has been adopted by some photographers for obtaining a more correct representation of trees, &c. I have tried its use in copying flowers, taking nearly the same contrasts of colors as in the experiment mentioned in the last Number of this Journal (page 86); and although by working with iodide or bromide of silver and no quinine bath, I have not succeeded in getting quite so good a representation of the effect of the colors as I can on bromide behind quinine, yet I am convinced that the experiment mentioned as having been obtained with iodized collodion, is far from a good specimen of what iodide of silver can be made to do by careful management in the hands of an experienced manipulator.

THE CRYSTAL PALACE PICTURES.—THE FRENCH SCHOOL.



WHEN one mentions the French school of Painting, through what a bewildering variety of style does one's memory wander! of a surety the French are as fickle in their pursuit of Art, as they are in their chase after Liberty. Paris has seen as many total art revolutions, as governmental ones, which is saying a great deal. Now it is DAVID, with his grand, unnatural, heroic style that mounts the barricade, and proclaiming the siege of Homer and Tacitus, astounds the public with any number of naked Greeks in hel-

mets. For a short time everybody paints *a la* DAVID. Now it is PAUL DELAROCHE, great and simple, who paints poetry, and tells his story better than any living man. Of course he is imitated—but how? The naked Greek dodge is easily come, but Delaroch is a flight beyond imitators. And so it is to the end of the chapter. Art in France is always changing. The people love it, and appreciate it, but novelty sways them, and they run after the last painter as they dance and carouse around the rootless trees of Liberty which they know will be dead to-morrow.

The modern French school of painting thus presents a varied array of styles, some

good, and some bad; but through all there runs a thread of national character, linking them together as the string links coral, agate, and other beads of a composite necklace. As a general rule, the last thing one must expect to find in a French painting, is nature. In literature they give human nature as far they know it. Rousseau, Moliere, Dumas, Lamartine, have all given us what in Paris pass for natural pictures. But all the while it is French nature, as abnormal, peculiar, and illegal, (speaking in the highest sense,) as the small feet of the Chinese, or the increased cerebellum of the Flat-head Indians. A Frenchman is the eccentric of the universe. They laugh much at the Englishman, and fancy him the most eccentric of the human species; but, in reality, they transfer to another head the cap which fits their own. They live in open conflict with nature. Their sentiment is unnatural; their courage is unnatural; their grief descends into abysses beyond the earth; their joy mounts into some uncommon atmosphere. Even when, from some outward or other cause, they die, they will not condescend to leave the world in a natural manner; but charcoal, or chloroform, with a pretty toilette, and a touching poem lying on the table, constitute the Gallic idea of the way in which the other world should be entered, and this forsaken. It is not surprising that a nation so artificial in every day life, should continue to be artificial on paper and canvas. They are always striking an attitude before a Psyche glass, and wondering how they look. If the Frenchman can only succeed in looking grand, he does not care what else becomes of him. He lives, suffers, and dies, for effect.

Look at Watteau! are these people natural that he gives us? There is a delicious garden, and shaven lawn, with prim terraces fading infinitely into distances. The hedges are clipped and that fine laurel on the right hand is sheared into effigy of a mild green lion. What it would have been had it been let grow, one saddens to think of. In the middle of the smooth grass plat, a group of men and women are idling the hours away. What men! What women! The one be-wigged, and gartered, and buckled up in high heeled shoes, and crooking their fore quarters into what they call graceful attitudes, and flourishing

cane and pouncet box as if they had no other idea in life, poor things, than the management of those absurd articles; the other ranged, and bolstered up in whalebone, spherical with hoops, and rustling with brocades; flirting their fans before their patched cheeks, and ogling the caparisoned monkeys by their sides, as if they thought them men instead of sickening caricatures. See! there is a couple wandering off down that shaven alley. They are lovers, but see what sort of love they make. He is tripping daintily by her side on the very tips of his toes, holding his pouncet box between his finger and thumb, and elegantly managing his sword. He leans over until the powder from his wig falls on her painted shoulders. He is no doubt telling her in insipid *conchetti*, stolen from Ronsard, that her eyes are brighter than Venus's, and her face more beautiful than Helen's. She simpers behind her fan. She rustles her pink brocade tenderly. How well Watteau painted those brocades! She can't blush, for she is already pretty thickly rouged, but she can show her foot, squeezed into an abominable little red-heeled shoe, and she does show it unhesitatingly. She is lost in apparent delight at the divine compliments bestowed on her, but is, in reality, in agony to know whether the patch near her left dimple has not moved from its place. Nothing true, nothing human or natural in this love. It is a rouge and satin daub, which no amount of finikin execution will excuse. This is nature *a la* Watteau. Nature curled, and painted and combed, and utterly unreal.

We have other duties to fulfil, however, besides abusing Watteau, and delivering long dogmatic tirades upon art; but we have so great a reverence for nature and those who interpret it, and so utter a contempt for the miserable beings who travestie it, that we cannot help now and then being a little more diffuse than perhaps our readers are willing we should be. A name great in French art greets us at the very outset of our solemn promenade through the Picture-Gallery of the Crystal Palace. You have no idea, reader, with what majesty we make the tour of that institution, with a huge notebook and hugeous pencil, and how the mere visitors hold their breath as we write:—but to resume. We are arrested, on the first page

of the catalogue, by the name of Horace Vernet. Vernet is a name great in Paris. He paints very catching pictures. His coloring is vivid, and he has much imagination in his composition. He is fond of stirring, soldierly subjects. An episode from a battle, with three or four plunging horses, savage riders, smoke, pistols, sabres, and a man falling dead from his saddle—he does these sort of things very spiritedly and effectively. Who does not recollect that terrible episode from the history of French troops retreating from Moscow. Only two figures—drear, desolate figures, all the rest snow, and dim, cold, gray mist. One, an old chasseur with gaunt face, hollow eyes and heavy moustache, on which the frozen breath is clinging, is seated in the snow, watching over the body of a youth who has perished in the cold. They had been friends—one can see that at a glance. The old soldier had doubtless helped and protected the slender youth to the rude trials of the camp, and even now in death he still protects him. The old red cloak is half flung around the body, and the rough warrior grasps his pistol, and the stern brow tells us that no wolf shall mutilate his friend while he has life. But he will die, too. Famine crouches in the hollows of his cheeks, and his face grows livid with the cold. In a few hours, if the snow does not cover them, the wolves will have a meal on both. It is a terrible, gloomy picture, poetic, but dantesque in its significance. No. 12. Verney's contribution to the Crystal Palace Gallery, is called "The Angel of Death bearing off a young girl." It is poetic in its treatment. Azrael, in which the painter has produced a fine effect by shrouding his form in a dark cerement, all but the wings that flap heavily over the bed, is lifting silently the form of a young girl from her sick couch, while her lover, with his face buried in his hands, dare not look on the moment of dissolution. She points upwards as she rises, and of course her ascent must be regarded as altogether typical. Stripping it of poetic sentiment, the picture in detail is bad. The kneeling lover looks smaller than life size, owing to the glorification, and consequent apparent enlargement of the dying girl. In attempting to strike the medium between spirituality and humanity, he has produced only a sickly flesh-tint which is eminently

unpleasant. Once overlook the sentiment and the moral, and Vernet's picture must produce a most disagreeable impression.

30. All Saints' Night. A Laloir. This picture, which is in itself dim in outline, is hung so high that we cannot speak of its merits. It appears to be a church-yard scene on all Soul's Night, when corpses rise from their graves, for some object which we never could discover, and having shivered among the tombs for some time, vanish when the cock crows. It seems a very gray and ghostly picture.

34. Ophelia — Leopold Burthe. An attempt to paint that which has never been successfully painted, always excepting John Millais' picture, produced a year ago in London. A woman floating down a river is as unpromising a subject as an artist could choose—difficult to handle, and only to be made acceptable by the most exquisitely poetic treatment. We can imagine Ophelia floating down the stream, murmuring sweet, mad poetry to the willows as she went, and taking her farewell of life in song. But how so paint it? It is by drawing an insipid young woman in white muslin, who is stuck horizontally into the water, as automaton ships are stuck into the calico oceans, on which they are tossed? M. Burthe's Ophelia is neither touching or well drawn. Her bosom is preposterously developed, and her face meaningless—not mad.

98. St. Martin de Cluse, in the Dauphinee. A Dubuisson. An excellent picture, although not prepossessing at the first glance. A bold, naked, picturesque gorge, with naked hills around, and in the distance, and a cold, blue stream, rushing over a shallow bed of pebbles. There is over the whole scene a mysterious, shelterless hue, which is admirably given. Everything is naked and bleak, and you feel that no sum of money would tempt you to live in that old farm house on the right-hand side. We never remember to have seen before the peculiar sharp bleakness of hill country so perfectly given.

251. Good and bad luck. Dehaussey. A foolish picture of the Watteau class, with, however, some meritorious points. A lady and gentleman, of the time of Louis Quatorze, fishing in a pond, attired in full court costume, and attended by a negro boy in fantastic garments. The cavalier

has caught a frog—that is, has caught a green animal with long legs, which is not one atom like any member of the tribe *Rana*; while the lady has pulled up a minnow, about an inch long. The picture is called “Good and bad Luck.” Where the good luck lies we have failed to discover, unless it is with the negro boy, who is laughing as if he had found a treasure, it is the best painted part of the picture.

266. French Squadron, a marine view. Morel. A fine effect of a storm passing off at sea. The sky is bold and unconventional, and the sea has the discolored transparency observable when dun storm-clouds overhang it. The frigate in the fore part of the picture is admirably painted.

301. Wreckers. Ed. Luminnais. One of the most vigorous pictures in the Gallery. The subject chosen is a terrible one though the artist has sometimes succeeded in grasping his subject forcibly, he has in other places, while showing the intention to be sublime, unhappily only exhibited lack of ability. The painting, though defective in some of its details, is nevertheless worthy of attention from its bold and decided character. As the name indicates, it portrays one of those ferocious scenes of rapine which occur so frequently on dangerous coasts, such as that of Brittany. A party of wreckers are clustered on a rock, some fishing for plunder with boat-hooks, others grasping with eager hands at some floating fragment of wreck, all engaged in some work of cruelty or brutality. One man has seized the corpse of a woman, and, is trying to tear off from her neck a coral necklace. The cord will not break, and his son is handing him, from behind, a clasp-knife to sever it. Mr. Luminnais has here committed a fault. The man in such a case would look toward the boy; instead of which he stretches out his hand behind him, taking on chance, whether he can clutch the knife or not. The foam that beats over the rocks is a solid green—that is, it is not a foam at all, but fragments of green water. Now such a sea, breaking over such rocks, would make white foam, and nothing else, whatever M. Luminnais may say. There is one terrible episode in this picture—a touch of real sublime poetry. Floating on these troubled breakers is a mass of sail and rigging entangled round the fragment of a mast, and

from underneath one corner of this heavy, sodden sail, you see a pale, dead hand peeping. And your fancy completes the rest. That wretch, out on the raging sea, smothering beneath that heavy pall, with no liberty to strike out for life, or see the broad heavens as he drowned! The terrible clutchings, the strong struggles to get free, the dead weight of the sail that encompasses him hopelessly, until in that horrible prison the waves strangle him. All this told by that single pale hand peeping from the tangled mass of rope and sail cloth! The figure of the woman is, we think, of too cholera a color. The faces of drowned people frequently become livid purple, but the body rarely. In this instance the feet and legs are rarely azure.

To a similar class of picture belongs No. 474. It is entitled, “Scene of an Inundation on the borders of the Loire,” by A. Antigua. This is another scene of violent human action. A family have crept on the roof of their house, which the waters have surrounded, and lie crouching there in various attitudes of terror. Before we presume to give any opinion of our own upon this painting, we must confide to the reader what we heard a man say who came to see the gallery. He was a miserable, dandified, self-sufficient looking snob, whose receding forehead and chin argued badly for his judgment, and well for his conceit. He had a lady with him, and he bustled up opposite the Inundation. The lady timidly asked him what it was. “Oh!” said he, perking his odious little nose into the air, “it’s an inundation, and the people have got on the roof of the house, and it’s a great big stupid picture, and that’s all about it.” And so delivering himself, he whisked the lady off, she poor thing fancying that this miserable ignoramus was one of the greatest critics that ever trod the earth. Now, we respect a man who finds fault with some show of reason for his motive, as being not willing to be led by the nose; but defend us from the censuring snob, who thinks it fine to find fault and believes that to abuse is to be brilliant. Many such creatures pass current in society, and amongst quiet people go down as men of taste. But Heaven help them if they get out into the world, and fling their stupid censures about before men who know better.

Now this picture is far from being bad. There are some exaggerations in it, but the entire conception is good. The boy's countenance is a little too much convulsed with terror, but then the figure of the terrified old grandmother, trying to climb upon the steep roof, with her grey locks flying in the wind, and her thin arms clutching at her son, who is assisting her, as if she had fifty years of her life to lose instead of five, is really admirable. In the matter of mere detail, there is much to praise.

The blanket caught up in haste by the old woman, and still hanging round her, is excellently painted. There is considerable confusion created at a first glance in this picture, by the perspective of the roof being on too great a scale which induces the idea at first, that the people are on a steep bank instead of a roof. This arises in a measure from the chimney being made so large and placed so far off, as to look more like a brick tower than a chimney.—*N. Y. Daily Times.*

"ON THE USE OF THE MICROSCOPE IN PHOTOGRAPHY."

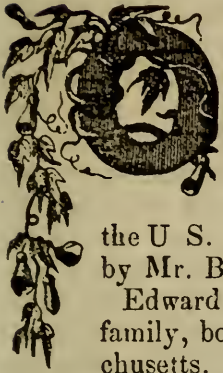
31, India Street, Edingburgh,
17th August, 1853.

SIR,—In the last number of the Photographic Journal, you allude to the progress of the application of photography to the delineation of microscope objects. The large aperture, which constitutes one of the perfections of recent object-glasses, would appear to be a cause of failure in the endeavor to produce an image of an object of any thickness. Allow me through your Journal to inform those who are interested in the matter, that I have found a very simple means of meeting this difficulty, with the lower powers, viz., by confining the light employed nearly to central rays. This is easily effected by using a diaphragm with a very small aperture placed in front of the object-glass. An apparatus of this kind applied to Smith and Heck's two-third glass, and with an aperture of one-fiftieth of an inch in diameter, will bring every visible part of an opaque object distinctly into view, of a thickness that requires about one turn and a half of the fine adjustment screw of Smith and Beck's students' microscope, to change the focus from the upper part to that for the visible edge, that is a thickness of little more than the hundredth part of

an inch. The effect of the diaphragm is of course to cut off a *very* large portion of the light, but with moderate condensation there is quite enough for the formation of photographic images on paper. The apparatus I have used consists merely of a cup with an aperture in it, and which fits on to the object-glass so that the opening may be in the line of the axis of the instrument. The position of the diaphragm is a point of great importance, as well as the size of the aperture, the former is readily determined by trial for best effect, and about one-fiftieth of an inch seems to be a good working size for the latter with the two thirds object-glass. The same effect may be produced by contracting the opening of the inner diaphragm of the object-glass, but the cap is more convenient, being more easily adjusted. I may add that the employment of the diaphragm with the eye piece is very satisfactory also. I hope that the present information may prove interesting to many who are pursuing this branch of photography, and should you consider it of sufficient importance to insert it in your Journal, it is not unlikely that I may address you further on the subject on a future occasion.

I am, Sir,

Your most obedient Servant,
E. W. DALLAS.

EDWARD EVERETT.

OUR illustration of the present number is a portrait of this great man from a very fine daguerreotype by Masuery & Silsbee, of Boston, two of the best and most artistic operators in the U. S. The crystalotype, as usual, by Mr. Black, of the same city.

Edward Everett was one of a large family, born in Dorchester, Massachusetts. The large hospitable-looking house in which he was born, is easily to be found in the old town, and seems to have been a fit cradle for the peculiar virtues of this distinguished man. For among his unquestionable virtues his family affections stood high. Pecuniary misfortunes from his early days shadowed the homestead, and called out the filial and fraternal affections which have marked very strongly the character and action of Mr. Everett.

From his earliest youth he was distinguished as a scholar, and his precocious talent and learning may be somewhat conceived from the fact, that at the early age of 19, he was called to the Brattle street pulpit in Boston, just vacated by the sudden death of the brilliant and pious Buckminster. At that time his learning was reputed to be marvellous, and in Boston at that period, there was a great excitement of ambition in the churches which had but lately become pronounced as Unitarian, to secure the services of the most brilliant talents. The young Everett was not anxious to be settled at the time, but his reluctance was borne down by the importunities of the gentlemen of the society who had tasted the intellectual delights which the idolized Buckminster knew how to spread around him, without at all neglecting the pastoral duties of his office, and the stilly desired that the parsonage should be the Temple of the muses. Mr. Everett was gifted for the latter office by ability and learning though he lacked the celestial charm of Buckminster, and his pastoral character. For Mr. Everett, though he has always been accused of desiring popularity, has not popular arts, either by nature or cultivation.

He had been settled two years, when he was called to the Chair of Greek Literature in Harvard University, the Elliot professorship having been founded expressly for him. He accepted the appointment on the condition of being allowed the salary during five years absence in Europe to complete his education. The condition was complied with, and after five years intense study at Gottingen in its most palmy days and at some other places, he returned to Boston and was inaugurated at Cambridge. He occasionally preached, however, and he commenced the system of lecturing, now so common in New England, but then rare. A friend of his, Mr. Theodore Lyman, presented to Harvard College the panorama of Athens, and Mr. Everett's first course of lectures in Boston was one explanatory of this panorama. The tickets were \$15 each, and he had a brilliant and fashionable audience. Both as a lecturer and a preacher he was exceedingly brilliant; as an officer of College he was very popular. His lectures given without notes, and replete with learning, commanded the profound admiration of the students. He proposed, however, some fundamental changes in the methods of study at the College which made him unpopular with the Faculty, who were rather alarmed at the additional duties threatened to them. These plans were warmly aided by Mr. George Bancroft, who was for a year or two, at this period, tutor of Greek, and who had been in Europe at the same time with Mr. Everett, also a devoted student there. The plans of these gentlemen were, however, entirely put down by the majority of the Faculty, who were accused of envying the reputation and popularity with the students, of their distinguished coadjutor.

While Mr. Everett was at Cambridge he married the daughter of a merchant of immense wealth, Mr. Peter C. Brooks.

His unpopularity with the Faculty dissatisfied him with his situation, and he accepted a nomination to Congress from the inhabitants of Middlesex. As his democratic politics were distasteful to the Faculty of the College they were not slow to find that to accept a political nomination was

not consistent with the duties of his Professorship, and Mr. Everett resigned his office. He was for many years in Congress where he was not so brilliant as he had shown himself in the pulpit and in occasional orations and lectures. His superiority as a scholar was rather a disadvantage to him in a scene where a certain worldly tact and ease avail more than treasures of learned lore. Subsequently, however, as Governor of Massachusetts, he acquitted himself with great ability and honor to himself. Here the situation required a willingness and power of labor, and for this he is eminently endowed. The fidelity and method of his daily life, as Governor, were the admiration of his council, who said that in the several years he held the office they never could detect the smallest omission or defect in carrying out, into the most minute details, whatever duty his conscientious views of his office suggested. The same punctilious exactness marked his career as minister to the Court of St. James. While in England he had a very severe affliction in the loss of a favorite daughter, which nearly broke down his manhood for many years. It has been remarked before that his domestic character is intense. He generally has superintended, himself, the education of his children, amidst all his public duties and cares, and in this daughter he found sympathy of taste to a remarkable degree. On his return from England he had hardly settled himself in Boston, when he was called to the Presidency of Harvard University. It was unfortunate for him that he was called to the office when so much depressed in spirits. Had he become President in the splendor of his youth, at the time he was so earnest for the reform of the studies, he would, it is probable, have enjoyed it highly. The time when he should have had it, was when the accomplished Kirkland resigned. In the mean while the office had been held by the elder Josiah Quincy, who was called to this chair from the Mayoralty of Boston, an office for which he was much better fitted. His administration of the College had been disadvantageous to all its interests—except the financial—which he knew how to care for. But Mr. Quincy is a poor scholar, and he certainly proved himself quite inadequate to stimulating young men to a high moral or intellectual career.

Mr. Everett found the morals of the College in the highest degree disorderly, and scenes enacted every day which were frightful in their license. He set himself with all his scrupulous conscientiousness, to a task which might have appalled the most courageous man, and Mr. Everett is of a timid temperament, and was now weakened by sorrow. The style of his action was not of that spirited character which seizes and conciliates the mind of the young. But the pith and marrow of his action had in it all the strength of his conscience. What he saw it was his duty to do, he did most thoroughly. Without making public examples of young men, he cleansed the Augean stable, revealing to the parents of every delinquent with scrupulous fidelity, the exact facts in the particular case, with advice as to the discipline they should use, and the influences they should bring to bear, upon those whom he advised should be taken home;—and soon the whole aspect of affairs was completely altered. During this process he suffered much obloquy, but most of the parents, at once, and the youths themselves afterwards, accorded him their grateful thanks and appreciation. He held this office but two or three years, and resigned with the intention of passing the rest of his life in retirement.

He has, however, since then, at the solicitation of friends, obeyed some calls to public life, and his later acts have shown a bolder and more adventurous spirit than was the expression of his younger days. The truth is, Mr. Everett never had any advantage from his temperament. He was never easily moved to action. It cost him very much to take a step forward. Nevertheless, having done so, he never has stepped backward. His conscience which had seemed to make him timid to act, made him firm to maintain any position he was induced to take. In such a case, age is an advantage. Wisdom, fruit of experience, "That only fruit which life's cold winter bears," more than supplies to such a one the loss of his youth.

Mr. Everett is a consummate orator, of a rare class in this country. His orations are ornate, but they are loaded with matter, which if not original discovery is yet wrought up with unsurpassed skill. As

a rhetorician he is not inferior to Burke. But his printed orations speak for themselves. His manner and enunciation are slow, but both beautiful and magnificent. Every word has its full enunciation, and

the roll of his musical voice, seems like an accompanying anthem, while the architectural splendor of his thoughts rises "like an exhalation" before the eye of the mind.

From the Journal of the Photographic Society.

PHOTOGRAPHIC PANTOGRAPH



THE insertion of the annexed letter from my brother-in-law, Mr John Stewart, of Pau, will much oblige me. The utility of this mode of reproduction seems indisputable. In reference to its concluding paragraph, I will only add, that the *publication* of concentrated microscopic editions of works of reference—maps, atlases, logarithmic tables, or the concentration for pocket use of private notes and MSS. &c., &c., and numerable other similar applications—is brought within the reach of any one who possesses a small achromatic object-glass of an inch and a half in diameter, and a brass tube with slides before and behind the lens of a fitting diameter to receive the plate or plates to be operated upon,—central or nearly central rays only being required. The details are too obvious to need mention.

I am, &c.,

J. F. W. HERSCHEL.

PAU, *June 11, 1853.*

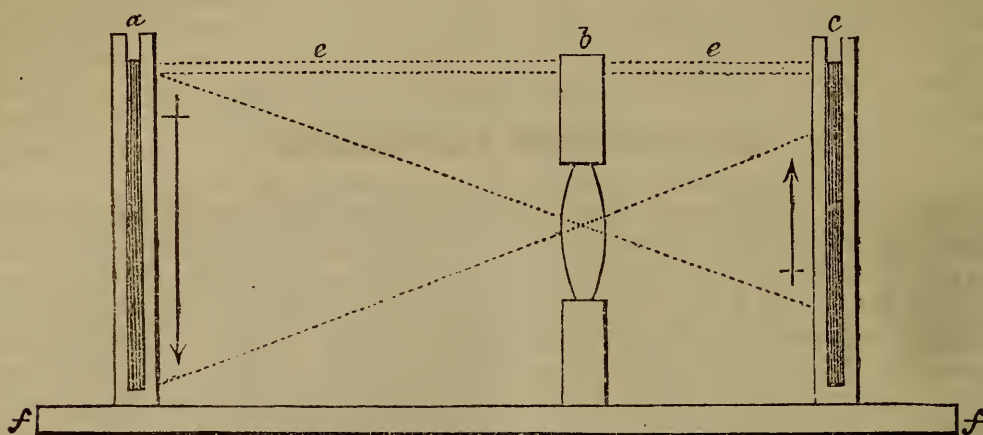
DEAR HERSCHEL,—I sent you some time ago a few small sized studies of animals from the life, singly in flocks, upon collodionized glass. The great rapidity of exposition required for such subjects, being but the fraction of a second, together with the very considerable depth and harmony obtained, gave me reason to hope that ere this I should have been able to produce microscopic pictures and animated objects. For the present, I have been interrupted. Meantime, one of my friends here, Mr. Heilman, following the same

pursuit, has lighted on an ingenious method of taking from glass negatives positive impressions of different dimensions, and with all the delicate minuteness which the negative may possess. This discovery is likely, I think, to extend the resources and the application of photography,—and with some modifications, which I will explain, to increase the power of reproduction to an almost unlimited amount. The plan is as follows: the negative to be reproduced is placed in a slider at one end (*a*) of a camera or other box, constructed to exclude the light throughout. The surface prepared for the reception of the positive—whether albumen, collodion or paper—is placed in another slider, as usual, at the opposite extremity (*c*) of the box, and intermediately between the two extremities (at *b*) is placed a lens. The negative at *a* is presented to the light of the sky, care being taken that no rays enter the box but those traversing the partly transparent negative. These rays are received and directed by the lens at *b* upon the sensitive surface at *c*, and the impression of the negative is there produced with a rapidity proportioned to the light admitted, and the sensibility of the surface presented. By varying the distance between *a* and *c*, and *c* and *b*, any dimension required may be given to the positive impression. Thus from a medium-sized negative, I have obtained negatives four times larger than the original, and other impressions reduced thirty times, capable of figuring on a watch-glass, brooch, or ring.

Undoubtedly one of the most interesting and important advantages gained by this simple arrangement is, the power of vary-

ing the dimensions of a picture or portrait. Collodion giving results of almost microscopic minuteness, such negatives bear enlarging considerably without any very perceptible deterioration in that respect.—Indeed, as regards portraits, there is a gain instead of a loss; the power of obtaining good and pleasing likenesses appears to me decidedly increased, the facility of sub-

sequent enlargement permitting them to be taken sufficiently small, at a sufficient distance (and therefore with greater rapidity and certainty) and to avoid all the focal distortion so much complained of,—while the due enlargement of a portrait taken on glass has the effect, moreover, of depriving it of that hardness of outline so objectionable in a collodion portrait, giving



a, c. Slides to hold the frames containing the negative and the receiving surface for the positive.
b. Frame, with the lens. *e.* Dotted lines, indicating the top of the box or frame.
f, f. Bottom board, or foundation of the same.

it more artistic effect, and this without quitting the perfect focal point as has been suggested. But there are many other advantages obtained by this process. For copying by engraving, etc., the exact dimension required of any picture may at once be given to be copied from.

A very small photographic apparatus can thus be employed when a large one might be inconvenient or impracticable, the power of reproducing on a larger scale being always in reserve. Independent of this power of varying the size, positives so taken of the *same* dimension as the negative reproduce, as will be readily understood, much more completely the finer and more delicate details of the negatives than positives taken by any other process that I am acquainted with.

The negative also may be reversed in its position at *a* so as to produce upon glass a positive to be seen either upon or under the glass. And while the rapidity and facility of the printing are the same as in the case of positives taken on paper prepared with the iodide of silver, the negatives, those on glass particularly, being so easily injured, are much better preserved,

all actual contact with the positive being avoided. For the same reason, by this process positive impressions can be obtained not only upon wet paper, &c. but also upon hard inflexible substances, such as porcelain, ivory, glass, &c.,—and upon this last, the positives being transparent are applicable to the stereoscope, magic lantern, &c.

By adopting the following arrangement, this process may be used largely to increase the power and speed of reproduction with little loss of effect. From a positive thus obtained, say on collodion, *several hundred* negatives may be produced either on paper or on albumenized glass. If on the latter, and the dimensions of the original negative is preserved, the loss in minuteness of detail and harmony is almost imperceptible, and even when considerably enlarged, is so trifling as in the majority of cases to prove no objection in comparison with the advantage gained in size, while in not a few cases, as already stated, the picture actually gains by an augmentation of size. Thus, by the simultaneous action, if necessary, of some hundreds of negatives, many thousand impres-

sions of the same picture may be produced in the course of a day.

I cannot but think, therefore, that this simple but ingenious discovery will prove a valuable addition to our stock of photographic manipulatory processes. It happily turns to account and utilizes one of the chief excellencies of collodion—that extreme minuteness of detail which from its excess becomes almost a defect at times,—toning it down by increase of size till the harshness is much diminished, and landscapes, always more or less displeasing on collodion from that cause, are rendered somewhat less dry and crude.

A very little practice will suffice to show the operator the quality of glass negatives—

I mean as to vigor and development—best adapted for reproducing positives by this method. He will also find that a great power of correction is obtained, by which overdone parts in the negative can be reduced and others brought up. Indeed, in consequence of this and other advantages, I have little doubt that this process will be very generally adopted in portrait-taking.

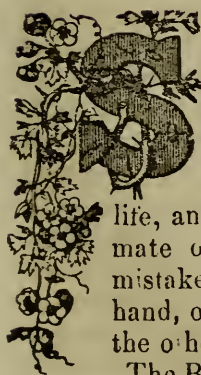
Should your old idea of preserving public records in a concentrated form on microscopic negatives ever be adopted, the immediate positive reproduction on an enlarged readable scale, without the possibility of injury to the plate, will be of service.

I am, &c.

JOHN STEWART.

From the London Art Journal.

LIFE OF B. R. HAYDON.*



EVEN years have now elapsed since the sad death of Haydon; a period sufficiently long for us to take an impartial review of the circumstances of his life, and to form some right estimate of his character, without a mistaken sympathy on the one hand, or ungenerous prejudices on the other.

The Biography of a modern painter, extended over three volumes of closely printed text, is a novelty indeed; so much so, as to induce the work announced, "who can the artist be of whom so much is written?" as well as another query, "what was the life of one who could furnish such materials?" The title of Mr. Taylor's book supplies the answer to the first question; the experience of Haydon himself, as recorded in his own handwriting, is the reply

to the second. And what a register do we find there; how much to make us pause and reflect on the infirmities of human nature, or to sorrow over intellect and genius diverted from its true and legitimate course of action by some baneful agency they have not the inclination or the power to resist. To the one or the other of these causes must be traced poor Haydon's unfortunate career from its earliest dawn to its melancholy and self-imposed termination.

We, who had some knowledge of him, expected to find much in his autobiography to lament, but we certainly were not prepared for such an exhibition of self-glorification and self-delusion as it records. It is out of no disrespect to the editor, who has done his duty, as an editor, with discrimination and fidelity, to say, "we wish the work had never been published; might we not justly add, "it never should have been." If Haydon's mind were not affected, or in plain language, if he were not mad, so strange a character is rarely to be found; if he were, and it is only charity so to consider him, he is much to be pitied. In the latter case his opinions can have no

* LIFE OF BENJAMIN ROBERT HAYDON, HISTORICAL PAINTER, FROM HIS AUTOGRAPHY AND JOURNALS. Edited and compiled by Tom Taylor, of the Inner Temple, Esq. 3 Vols. Published by Longman and Co., London.

weight, and are impotent for good or evil; in the former they ought to be deprecated and forgotten.

Haydon's family was originally, as he tells us, one of the oldest in Devonshire, and was also in good circumstances till ruined by a suit in chancery. His father was a bookseller in Plymouth, and when his son had finished his education at school, he was apprenticed to the business. Now to which of the two causes we have alluded to can be ascribed the state of mind of a youth who could feel thus, long after he had reached his meridian?—

"I knew enough of form to point out with ridicule the mishapen arms, legs, feet, and bodies of various prints of eminent men in my father's windows, and was censured for my presumption. I hated day-books, ledgers, bill-books and cash-books; I hated standing behind the counter, and insulted the customers; I hated the town and the people in it. I saw my father had more talent than the asses he was obliged to bend to; I knew his honorable descent; and I despised the vain fools that patronised him."

Was such conduct, (presuming, by the way, on his perfect sanity,) mere boyish freaks, or the first buddings of that temper or state of mind, which afterwards, and all through life, produced such disastrous results? Was it not this spirit—one of bitterness, and wrath, and uncharitableness—that pervaded almost his entire actions; pressing like a dead weight upon all his worthy and honorable aspirations, and checking their vigorous and expansive growth; that helped to mar his success, more than the backwardness of the public to recognise those principles which he had so much at heart? Hear how he himself accounts for his failure.

"Every man who has suffered for a principle, and would lose his life for its success,—who in his early days has been oppressed without ever giving the slightest grounds for oppression, and persecuted to ruin because his oppression was unremitted—who has incurred the hatred of his enemies exactly in proportion as they become convinced they were wrong,—every man who, like me, has eaten the bitter crust of poverty, and endured the penalties of vice and wickedness where he

merited the rewards of virtue and industry—should write his own life."

There was a spirit of fervent youthful enthusiasm that prompted one of his first acts after arriving in London to follow the profession he had determined upon; and yet one can almost discern in it a symptom of that "mind diseased" which never seems to have left him; a fancied reliance on a strength superior to his own, yet a real feeling of ability to work out his own fame without such assistance. There is no expression of humility conscious of requiring aid.

"The Sunday after my arrival, I went to the New Church (in the Strand), and in humbleness begged for the protection of the Great Spirit, to guide, assist, and bless my endeavors; and to open my mind and enlighten my understanding. I prayed for health of body and mind, and on my rising from my knees felt a breath assurance of spiritual aid, which nothing can describe. I was calm, cool, *illuminated as if crystal circulated through my veins*. I returned home, and spent the day in mute seclusion."

The passage marked in italics, which is our doing, corroborates the opinion we have just expressed; and surely it was not under the influence of the Divine aid which he conceived had been granted him, that we find Haydon in two following pages speaking of Northcote as a "wizened figure, looking maliciously," and laughing like "an imp." This aptitude for seeking out blemishes in others, calling vulgar names, and recording weaknesses of character, is evident all through the Journal; and as he took little or no pains to conceal his thoughts, it is not to be wondered at that he constantly made himself enemies. How much easier it is to see the mote in another's eye than to discover a beam in our own, is shown in his remark upon his "intimate friend," Wilkie, then but recently arrived in England.

"With the weakness of our poor nature, Wilkie became visibly affected in his fame,—talked very grandly,—bought new coats,—dressed like a dandy, but in vain tried to look one."

The above brief extracts will in some degree, furnish a clue to the character of the *man*; this cannot be disconnected

from that of the *artist*; we adduce them therefore to show, by a natural but sure development of such feelings, the unhappy artist worked out for himself all the consequences which might have been expected from such a state of mind.

Amid the accumulated mass of interesting anecdote and the pictures of artist-life which these volumes offer, it is painful to remark the desperate struggles which Haydon made to convince a public, who would not be convinced, that all Art dwelt in him alone. Abstractedly, his aim, to elevate the character of the English Art, was noble and praiseworthy, but the means used to attain the end were derogatory to that end. He would have taken the citadel of fame by storm, and would have dragged public opinion after his chariot wheels as a conqueror, and when he found himself unequal to the contest, less perhaps from ability and courage than from skilful generalship, he complains of "oppression," and accuses the world of neglect and indifference, or wearies it with the frequency and urgency of complaint. In fact, Haydon could never yield; right or wrong in his creed, his principles, or his ideas, he persevered in them at all hazards, regardless of consequences. He was not blind to this imperfection of character, as we find in the following passage, alluding to a difference he had with Sir George Beaumont respecting a picture the latter commissioned him to paint; it would have been well for the painter had he always acted on the knowledge of himself which is thus set forth.

"It would now have been my best course as he had agreed to my proposition, to have gone to work without another word; but I had always a tendency to fight it out, a tendency most prejudicial to an artist, because it calls off his mind from the main point of his being—perfection in his art. Why did I not yield? Because my mind wanted the discipline of early training. I trace all the misfortune in my life to this early and irremediable want. My will had not been curbed, or my will was too stubborn to submit to curbing;—Heaven knows. Perhaps mine is a character in which all parts would have harmonised, if my will had been broken early. The same power might have been put forth with

more discretion, and I should have been less harrassed by the world."

It is necessary ere judgment be given on a point of controversy that both sides of the question be heard. Haydon accused the Royal Academy of not doing honor to his merits by electing him into their body. The Academicians were not insensible to his talents as a painter, but experience had taught them he was not the fittest man to be their colleague. Yet they might have been inclined to hazard even this experiment, if his oral remarks and his written opinions had not justly given offence to many of its members. As a student he had, most unintentionally we allow, incurred their displeasure by taking a prominent part in presenting a testimonial from his fellow pupils to Buseli, the Keeper, and he declares that from that time he never respected them on account of the "malignant feeling" they evinced on that occasion; and it must be admitted their conduct, as Haydon narrates it, was but little creditable to a society such as theirs. It was five years however, after this, that his long pent up wrath broke out openly against the Academy.

"Enraged at its insults," he says, "I became furious; an attack on the Academy and its abominations darted into my head. * * * I was unmanageable. The idea of being a Luther or John Knox in my art got the better of my reason, and * * * in spite of Wilkie's entreaties, I resolved to assault."

The paper he had written was published in the *Examiner*, and, he writes,—

"Never since the art was established were its professors in such a hubbub of fury and rage. John Hunt went to the Gallery, and was assailed for the authors name. He told it; and when I saw him, he said 'You have fired your arrow, and it has struck in the bull's eye.' From this moment the destiny of my life may have said to have changed. * * * I was twenty-six years of age when I attacked the Academy. I exposed their petty intrigues, I laid open their ungrateful, cruel, and heartless treatment of Wilkie, I annihilated Payne Knight's absurd theories against great works, I proved his ignorance of Pliny, and, having thus swept the path, I laid down rules to guide the student, which

time must confirm,—rules, the result of my own failures, collected and digested within six years,—rules which posterity will refer to and confirm, early acquired without a master or instructor, settled in spite of folly, and put forth in spite of ignorance or rank.”

Is it to be wondered at that the Academicians should ever hereafter refuse to admit into their ranks one who had so abused them, and who possessed so fiery and uncontrollable a spirit, as threatened to ignite and disturb everything with which it came in contact? No greater justification for their conduct can be found than Haydon's own confession. His pen made more enemies than his pencil procured for him friends and patrons.

He was not, nevertheless, without these, and they were neither few nor niggardly. “Never did a painter receive more help than Haydon,” says the editor of these volumes, “in all ways but the right one;” by which “right one,” we presume is meant public enjoyment. But neither a government nor individuals can be expected to pay for what they do not care to have, or to support theories or principles which they either dispute or do not understand. If a painter does not choose to make his art popular, he should submit unrepiningly to the consequences; the alternative lies with himself. Hilton found no patrons for his large pictures, but he did not therefore weary the world with his complaints; he continued to paint them for his love of Art, and he painted portraits and smaller works for his bread; and thus lived respected and died regretted by those who knew him. Haydon might have followed his example; he would have sacrificed none of his reputation as an artist, and his end in all probability might have been peace.

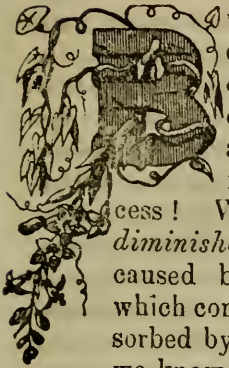
Hitherto we have dwelt on the causes which operated so prejudicially to his aspirations and interests; they are the dark

side of his character; his vanity, his obstinacy, the absence of delicacy of feeling, and his offensive treatment of those who differed from him. But he possessed traits of disposition that entitle him to his meed of praise; he was grateful to all who showed him kindness; he was not insensible of merit in others, though he allowed no equality with himself; he was most laborious and persevering in the pursuit of his art; and as a husband and father his conduct was blameless. On reviewing the whole of his history as written by himself, we can come to no other conclusion than that we recorded a month or two after his death: ‘Haydon studied himself, but he omitted those chapters of self-study which teach us to discover the value of others; had his knowledge of human nature been but as a small proportion of his knowledge of his art, it had borne him to a result very different from that which all so deeply deplore.’ * * * With all his knowledge, power, and industry, he turned his back upon the winning-post, and obstinately persisted he was moving towards it.”

We have not attempted a criticism on Mr. Taylor's volumes; our remarks are rather a record of our opinions on the subject of his work; but we cannot conclude without again expressing our satisfaction at the manner in which he has executed no very enviable task. His comments on the autobiography are judicious and to the purpose; he has not elevated his subject into a hero, nor lowered him into a position of a fool; he has “extenuated nothing, nor set down ought in malice.” But after all, the only lessons we are taught are the utter inutility of contending against adverse time and circumstances in working out a cherished project; and that genius, unallied with wisdom, may become an affliction instead of a blessing, and cause its possessor to “perish in his pride.”

THE SUNBEAM.*

Extract from a Manuscript Volume, soon to be published.



BUT how shall it be explained, that the plant does not *actively* suspend the decomposing of carbonic acid by night, if light be indispensable to this process! We answer, may not the *diminished* action still kept up be caused by some portion of light, which continues (so to speak) unabsorbed by the darkness! Heat, as we know well, has the property of becoming *latent* under certain conditions. It is believed by many, that a kindred quality is possessed by light; that, during the day, a portion of it is absorbed by and becomes latent in bodies on the earth's surface, and remaining invisible while the sun is above the horizon, is disengaged during the nocturnal hours. Thus the diffused, pale light, which enables us to discern objects partially by night, even when the moon and stars are muffled in dense clouds, is supposed to come from this source, as also is the light united by certain gems in the dark. Perhaps, then, the partial decomposition of carbonic acid performed by vegetables, in the absence of the solar orb, may be attributed to the light thus liberated from its latent state.

Among the numerous other agencies of light, I shall here notice but one,—I mean its powerful influence on the health and general well-being of both animals and men. I believe it is almost invariably the fact, that sick persons suffer most from their maladies during the dark hours, and experience greater or less alleviation of their pains while the sun is above the horizon. I was told by a friend, that while once afflicted by a violent irritation of the lungs and throat, he used to commence coughing precisely at sun-set and to continue perforce this tormenting process without intermission until sun-rise, when it instantly ceased, to be renewed only at the coming on of another evening.

There are, however, facts far more striking, which illustrate the genial, sana-

tive influences of this element. Savage tribes of both the tropic and the temperate zones,—of the first more especially—live almost entirely in the open air and sunshine, wearing, the while, but scanty clothing. Now, the fact is familiarly known, that malformation, disease, and debility of constitution are exceedingly rare among these races, while they are among the commonest of incidents with the denizens of the dark lanes and gloomy cellars of our cities. It is said, that numbers of the poor in the French city of Lille had been used to inhabit certain dark recesses beneath the fortifications, until the Magistrates, ascertaining that the majority of those born there were somehow deformed or diseased, passed an edict compelling the removal of these people elsewhere. It is, moreover, thought that cretinism and the goitre, repulsive maladies prevailing among the Alps and Pyrenees, are owing to the absence of sunlight, as their victims inhabit deep, shady gorges, but partially penetrated by the solar rays.

But a still more curious proof of the potent agency of light, was discovered by a French naturalist; he found, that tadpoles could not undergo their wonted transmutation into frogs, if kept sequestered from sunlight, although they continued increasing in size and weight *as tadpoles*! It would seem, then, that those corporal transformations, through which such myriads of the insect and reptile tribes pass, are vitally dependent on the influence of the sun's luminous rays.

But I must take up the remaining branches of my subject.

II. OF HEAT. It is estimated, that when the heat-rays, in their transit from the sun to the earth, enter the atmosphere enveloping the latter, they are so much affected by the ærial fluid, that one-third of them becomes absorbed thereby, and two-thirds only reach the terrestrial surface.—Hence, it appears, that one office of our atmosphere, is to protect animal and vegetable life from their unmodified fervor of the sun's heat, which would destroy it.—

* Continued from page 253, vol. 6, No. 4.

Few, perhaps, are aware of the quantity of caloric received from that orb. If you were to imagine our globe entirely incased with solid ice forty feet thick, the heat reaching it from the sun in a single year, would, by calculation, suffice to liquify the whole enormous mass.

I have already noticed the remarkable property of becoming *latent* inherent in caloric. Thus a volume of ice,—otherwise water *solidified* at 32° F.—when subjected to 172° F. of heat, becomes fluid, and yet the resulting water remains precisely at the temperature of ice, or 32° F. Consequently 140° F. of caloric have become latent, so as to be appreciable by no test yet discovered.

Again, when water passes into steam, or evaporates, 1000° F. of heat assume the *latent* state, since steam is of exactly the same *sensible* temperature with *boiling* water, which stands at 212° F. For this curious attribute of caloric we can discern a use alike wise and beneficent. Thus, as the sun reaches the goal of his northern journey on the 21st of June; and as his ray *then* reaches us most *directly*, and by consequence in greatest quantity; it would seem inevitable, that our hottest weather should bear this date. Generally, however, the intensest summer heats fall a month or more later. In fact, were we to pass *at once* from the biting airs of winter, and the boisterous, penetrative blasts of spring, to a May or June of the welting heats, we should naturally anticipate—such heats as do actually characterise our July and August,—not only severe suffering, but wide-prevailing debility and disease would be the well-nigh unavoidable result. From this evil we are shielded by the provision of latent caloric. By the gradual melting of the snow and ices of winter and spring, large quantities of the solar heat become *progressively* latent, and therefore do not injure or annoy sensitive beings. The same result flows from the immense evaporations incessantly going on in all the waters of the globe under the solar beams in their greatest intenseness. And, besides *these* methods of attempering in our behalf the fervid heats of opening summer, while we gradually grow inured thereto, it has been ascertained that every object on earth, whether organic, or inorganic, animate or inanimate, and the very soil itself, have

the property of absorbing caloric in considerable measures, and reserving it until its disengagement is required by the various exigencies of vegetable and animal life.

But while, in these and kindred ways, living creatures are prepared for the transition from cold to heat, there occurs, on the approach of winter, a process exactly the reverse and for a reverse end. On the 20th December, we should expect our intensest cold, as then receiving the *minimum* of the sun's heat, on account of the obliquity of his rays. And yet the latter half of January and the main part of February, constitute usually our severest season. The reason is, that by the transmutation into ice of immense bodies of water, with the consequent disengagement of the latent caloric, that kept them fluid; and by condensation of ærial vapors into snow, together with the liberation of the semi-latent heat previously absorbed by the earth and the objects on its surface, the severity of the cold is so far mitigated, that our systems become adapted to what they must encounter. What mortal parent, even the tenderest and most affectionate, ever so cared for the well being of his children?

I presume most persons have read of the experiment performed by Dr. Franklin to ascertain whether the *color* of a substance has any connexion with the capacity of absorbing and radiating heat. Laying several differently colored scraps of cloth on the snow, where they were exposed to the sun, he found considerable diversity in the rapidity, with which the snow melted beneath them. His experiment has been repeated by Davy and others, and the result attained by all was, that the black possessed most absorbent power; and that brown, green, red, yellow and white succeeded it in the order of their names. It was ascertained also, that the power of a substance to *radiate* caloric corresponded exactly to its power of *absorbing* it. In selecting the color of our garments for summer or winter, this knowledge may perhaps avail us.

The same principle in respect of color pervades the whole vegetable world. The damask rose, which bears its beautiful ruddy tint because it *reflects* merely the red luminous ray of the sunbeam, while *absorbing* the rest, imbibes also a larger share of

its *heat-rays*, than does the *white* rose of the same bulk, which *reflects* the whole of the sun's light-rays and *absorbs* none, and by consequence absorbs fewer of the heat-rays. The bulb of a delicate thermometer, placed successively within the corollas of these two flowers, exhibit the mercury as rising considerably higher in the red than in the white one.

It appears, then, that those exquisite flower-tribes, which one might fancy beautiful characters whereby God has written His immeasurable love all over the green page of earth, subserve ends of *utility* not less than of *embellishment*. For, first imbibing large measures of solar heat and thus aiding to protect living creatures from its excessive summer fervors; next, absorbing from the atmosphere that carbonic acid, which, *unmodified*, is hostile to all animal life; they finally exhale into the air their fragrant breath freighted with that oxygen, which to universal animate existence is a prime necessity. And, all the while, their delicate loveliness is a perpetual charm and blessing to the eye, while their wondrous organism speaks more potently, than man's sermons or homilies, of thir creator's benignity and wisdom.—Most felicitously says the poet,

“Neath cloistered boughs each *floral-bell* that
swingeth,

And tolls its incense on the passing air,
Makes music to the soul, and ever ringeth
A call to prayer.

It is too familiarly known to require discussion here, that caloric is the principal agent in generating winds, from the irresistible tornado and hurricane to the gentlest zephyr, and that it enacts also an important part in the development of electricity and magnetism, elements so essential as to be almost identical with the currents of universal life. Omitting, too, much else, that might interest, pertaining to this subject, I proceed to the third constituent of the sunbeam.

111. OF ACTINISM. This being the element, with which the heliographist is chiefly concerned in the exercise of his art, it is of the utmost moment, that he acquaint himself with whatever is known of its quality, relations and effects. And, as less is known as yet of Actinism, than of either Light or Heat, he, with the students of science generally, has before him a large

field for investigation and experiment. In consequence of Daguerre's discovery, it has been hitherto studied mainly with reference to its influence on the mineral or inorganic world. Something, however, has been learned of its action on vegetable and animal structures, and on this I will briefly touch.

With the depositing of the seed beneath the soil we detect the commencing operation of the actinic elements. Full experimentation has demonstrated, that actinism is the proximate cause of *germination* aided but little, if at all, by light or heat. You may exclude the last two, and yet under the radiation of the first, with the furtherance of moisture, a seed will sprout in twenty-four hours. Conversely, exclude actinism and expose such seed to light and heat, and it will remain for days without signs of germination. In fact, until germination has begun and the plant has risen above the surface of the soil, light,—strange as it may seem—is an *absolute hindrance* to the commencement of growth; so also is heat, at least in that *unmodified* state, in which it issues from the solar fount. Little, then, as the husbandman is aware of it, the actual ground of the necessity for burying seeds in the earth is, that the soil may serve as their screen from the full power of the solar light and heat. Actinism, being a chemical force whose leading function is to decompose and alter the arrangement of the constituent atoms in whatever it touches, is enabled to act upon the seed by first penetrating its earthy envelopements. It transmutes the original starch of the seed into gum and sugar, which are the proper nutriment of the vegetable embryo. The tiny root perforates the husk and shoots downward, while the baby stem pushes upward into the sun-pervaded air. *Then* all three solar elements join forces and continue their *united* operation through all after stages of the plant's life. Most likely, very few of the total number of offices executed by each in the mysterious process of vegetative growth are as yet known. We do, however, know that neither of the three *singly*, nor either two of them jointly, will avail to perfect the plant, but that all must co-operate thereunto. That actinism, nevertheless, performs an important part in the process is obvious at first thought. For it

is emphatically the *decomposing* power ; and decomposition is incessantly required in vegetable nutrition, corresponding in the plant to the action of the gastric fluid in animal digestion.

Not much has been thus far determined concerning the effect of this principle on animal life. Analogy, however, intimates, that it must needs be considerable. Indeed it is beginning to be suspected, that a portion at least of the influences on animal health and developement, ascribed heretofore to light, should properly be put to the account of actinism.

Many interesting discoveries have been achieved in respect to the relation of this element to inorganic substances ; such having the direction given to investigation by its connexion with the heliographic art. Thus the chlorine and hydrogen gases will not effect a chemical union in darkness.—But, on their exposure to sunshine, an instant combination is produced by actinic influence.

So, again, *peroxalate* of iron in solution remains unaltered in the dark. But, brought into sunshine in a glass vessel, it passes into a vehement fermentation, which terminates in the precipitation of *protoxalate* of iron in small crystals of a brilliant yellow tint.

Actinism, like caloric and light, is partially *absorbed* by certain bodies. In evidence of this fact, if you first expose chlorine to the solar beam, it *then* will unite with hydrogen even in darkness.

As a decomposing force, actinism effects some change in the atomic arrangement of every body, whereon it falls, be it the hardest rock, or the softest wood or leaf. Were it not for *counter-working* and *reparative* agencies in the economy of creation, this so delicate-seeming power, the select tender nurse of the vegetable infant, would ultimately crumble into ruins the total frame work of the material universe ! But, no sooner

torative to the latter, as to the former, and arrests the advance of decomposition beyond that degree, wherein it subserves the ends of the universal well-being.

In a succeeding chapter I shall briefly describe the daguerreotype process, with the actinic agency therein and the chemical substances contributing to the result. Before closing this chapter, however, I will simply mention, that by an ingenious apparatus heliographic pictures have been produced in *absolute darkness* ; arrangements having been made to exclude light *entirely* and heat *mostly*, while free course was given to the actinic rays. The success of this experiment establishes beyond question the point, that the actinic, and neither of the other two constituents of the sunbeam, is the *working* instrument of the heliographist. This conclusion is further verified by the fact that, *cloudy* weather is no less auspicious to the production of the heliograph, than days of most brilliant sunshine. Indeed the prodigal solar radiance of tropic climes is less propitious to the successful exercise of this art, than the paler sunshine of our chilly North.

Some Savans have long thought, that electricity, or magnetism, or the odd force — (or, speaking more rigorously, *all three*, since all three would seem to be the *same radical element* in different staves of *refinement*),—makes a fourth constituent of the solar beam. Until recently, however, this point has been contested, the majority of inquirers having decided in the negative. But there is no longer any room for doubt. Baron Von Reichenbach, a German philosopher of genius alike acute, comprehensive and profound, has demonstrated by abundant and conclusive experimentation, that not only the sun, but the moon, the planets and the total universe of the stars all send forth a continuous, uninterrupted current of the element thus variously named. And not these alone, but the earth itself, all material substances, all animals and even all human bodies are found to be originating sources of the same subtle principle, which would seem to be the Creators chief instrument in material causation.

I will now close this summary account of a matter highly important, as well as in-

“ Comes still evening on,
And in her sober livery all things robes,”

than the action of this disturbing element is suspended. That rest, which is indispensable to man and beast, is not less so to vegetive existence. Such rest is a *res-*

trinsically interesting with the hope, that my professional compeers may be induced to cultivate a field, which, though known to be incalculably rich, is yet but partially

explored, in such a manner as largely to augment our existing knowledge.

M. A. Root.

140 Chestnut Street, Philadelphia.

Nov. 8th, 1853.

From the Jour. of the Phot. Soc.

ON THE EMPLOYMENT OF CYANIDE OF POTASSIUM FOR DIRECT POSITIVES ON COLLODION.

BY M. A. GAUDIN.



AMONG the multitude of operators who use collodion, a very small number have devoted themselves to the production of direct positive proofs. The reason is that the normal plates are more generally employed than half plates, quarters, or plates of still smaller dimensions. When operating on a normal plate, no one can resist the desire to produce a fine negative susceptible of giving an indefinite number of positive impressions; this size allows of our obtaining the features of the face and the details of the dress with sufficient delicacy. With the plates of very small dimensions, the ultimate purpose is reversed: paper will no longer give all the delicacies of the negative, or rather, the positive proofs on plates of small dimensions are infinitely above the positive impressions that can be obtained on paper, where we carry the proof into the state of negative.

The extreme readiness with which these positive proofs may be obtained, renders them of great value for portraits. As yet, in my opinion, photography has required too lengthened a sitting to allow of its giving the expression which, alone, gives portraits a charm; the look is always fixed or fatigued by the light, defects which arise at once from too much light and too long sitting. Reversing the impression is also indispensable in claiming resemblance; I have spoken of this too often to dwell upon

it here. In fine, a process which enables us to obtain a miniature portrait, even a quarter size, in one second, in ordinary laboratories, with all the delicacy of the plate, and often with superior vigor, from the greater intensity of the lights, such a process, I say, seemed worthy of attention.

The reflection from these proofs is almost nothing. They do not become invisible, like daguerreotypes, behind a white curtain or in a white reflection; the only reflection existing comes from the surface of the glass; consequently they are superior to impressions on silver in a multitude of points; if there is less firmness in the design, there is all the more charm.

The best liquids for developing the images are sulphate of iron and cyanide of potassium: the latter salt ought to be employed in an extremely weak proportion: I have carefully studied it, and constantly obtained results excellent in the brilliancy of the whites and the integrity of the half-tints.

The cyanide fit for this purpose is the 'purified cyanide,' which is in a white powder; the cyanide in cakes is often impure. The pulverulent cyanide is employed in the proportion of 15 grains to a quart of common water, which makes the quart of liquid, as fit for use, come to less than the tenth of a penny. The liquid is renewed for each proof, not on account of being rendered bad, but rather for the sake of strength, since with such a weak proportion, the solvent principle is quickly exhausted.

I have always succeeded well in washing the plate with the quantity of fresh liquid sufficient to form a bath for it. When I have employed the same liquid in large quantity for a number of proofs, it seemed to lose its solvent power very quickly. Was this by decomposition from contact with the air, or in consequence of a little acid which the plates always retain when taken from the bath of sulphate of iron, after a moderate washing? I could not make sure; only the inconvenience I have noted appeared certain: it is true I have always avoided thoroughly washing the proofs when taken from the sulphate of iron; having succeeded to my full expectations after a superficial washing, I did not seek to know whether a thorough washing would be better. A superficial washing, with the cyanide renewed each time, leaving nothing more to be desired, and the cyanide in this proportion costing almost nothing, this expeditious method appeared to me to have a value marked enough to render it useless to look for another.

It is evident that in this process, the cyanide, already in very small proportion, is quickly exhausted by its saturation and decomposition in contact with free acid; so much so, that when the iodide of silver is gone, there remains, so to express it, no more free cyanide capable of injuring the half-tints.

In positive proofs such as I produce, it is important to preserve the smallest details; I have left them several hours in the cyanide used in the above way, without their being in the least weakened.

Negative proofs for printing on paper are usually fixed with hyposulphite of soda, in such a way as to leave an opalescent tint on the lights. It is said that they print better with this precaution; I am not convinced of this; I shall make a regular trial to ascertain it; if untrue, as I suspect, the employment of the cyanide in the proportion of one-thousandth would be more convenient and more economical.

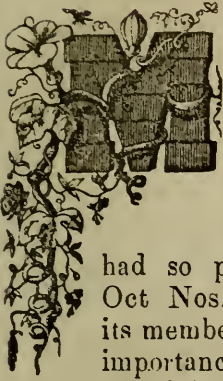
Much trouble is found in framing these positive proofs, because no *passe-partout* has yet been adapted for them; but the glass has just been discarded. M. le Baron Séguier tells me he has obtained very attractive proofs of this kind, by placing the collodion on black waxed cloth, which at the same time serves as a background. This process would have the disadvantage of giving the portraits in reverse, which I do not think balances the fragility of the glass.

Further Note, April 30th.

In my last article when speaking of the use of cyanide of potassium, I expressed myself in a way to lead to the idea that salt would be decomposed by contact with air; I have since detected that the cyanide in the proportion of 1-1000th, left in an open bottle for a month, has lost none of its strength; it acts as well as when first prepared. Consequently the decomposition of the cyanide used in quantity arises solely from the acid remaining on the plate after a superficial washing when taken from the sulphate of iron. This is one hindrance the less against using it in quantity, and a reason for believing its employment in this condition would be successful when the plates were previously washed with abundance of water.

The deleterious action of the cyanide of potassium has been much exaggerated; I myself thought it more dangerous than it really is. The last account I have heard of it seems to prove that it will be unnecessary to be afraid of employing it in photography. A competent person has assured me that *a dose of 7½ grains has been administered internally without inconvenience*. After that, who would hesitate to wash his hand with it, and to set to the account of the excess of alkali the supposed pains and colics which a great many photographers have attributed to the employment of the cyanide?

COMMUNICATION.



R. EDITOR—Sir, You have doubtless ere this been informed of the proceedings of the New York State Daguerrean Association, at its late Annual Meeting in Utica. It is to be regretted after you had so promptly in the Sept. and Oct. Nos. of the P. A. J. reminded its members of the meeting, and the importance of attending, that no more could have made it convenient to attend. Charity, however, will induce us to believe, that it was not a want of interest in the society, or a lack of zeal on the part of its friends; the weather was unfavorable; and again, the great attractions at the World's Fair undoubtedly had its influence. I trust, however, none will be discouraged or feel less interest in promoting the objects for which the society was organized. So long as such men as D. D. T. Davie take the lead, no enterprize can fail if there be a concert of actions, and union of feeling in minds of similar mould. Though a stranger to him he received me with kindness and gentlemanly courtesy; also, his amiable lady, offering me the hospitalities of their home during my stay in Utica, for which they have my heartfelt thanks; sympathy and kindness is often worth more to the receiver than gold and silver. I would not be guilty of fulsome flattery, I despise it, but honor to whom honor is due, and Mr. Davie appears truly worthy the name of gentleman; could the same be said of all engaged in the profession, much reproach would have been saved which has

accrued to those engaged in picture taking. Disreputable cars would be abandoned, the habit of becoming all things to all men for the sake of mere gain, would be exchanged for the principles of probity and honor. I would not be censorious but too often has the remark met my ear;

"You can't depend on the word of such and such daguerreans"; with how much truth this may be said the consciences of all concerned can attest. The primary result of the study of the natural sciences tend to improve the understanding and enlarge the heart. The works of art excite our admiration and love of the beautiful; why then should not nature and art combined, tend to elevate and purify our sensibilities, and the whole moral character be improved by the study and practice of one of the most wonderful discoveries of modern times. A discovery which has added so much to human happiness by strengthening the ties of affection, prolonging friendships, happying lovers, consoling parents when the loved and lost are mouldering back to dust, I love the Art, I reverence the memory of him who was the discoverer, and I hope all who are endeavoring to promote the prosperity of the profession may be successful, that when the future historians shall record the scientific and artistic history of our country, "The New-York State Daguerrean Association" may fill her proper niche in the annals of her fame.

MARCELIA W. BARNES.

Salem, Chautauque, Co.

N. Y. Oct. 30th, 1853.

[From *La Lumiere*, March 19th, 1853.]

MODE OF KEEPING EXCITED COLLODION PLATES SENSITIVE FOR MANY HOURS,"

BY M. A. GIROD.

The inconvenience of collodion, which gives such rapid and strong impressions, has

been, that it could not be spread upon the glass plates and rendered sensitive, long enough beforehand, to allow of the operator going to take views or other pictures at a distance, carrying only the camera and the frames filled with their plates, and re-

turning home to develop the impressions by the ordinary means. The following process enables us to overcome this disadvantage.

Two glass plates, of equal dimensions, are taken and cleaned perfectly with tripoli and spirits of wine. On one is spread the layer of collodion, which is rendered sensitive at once, by plunging it in a bath of nitrate of silver of twelve parts to the hundred. When the streaks or veins have disappeared, which occurs in twenty or thirty seconds, the glass is withdrawn from the bath; then, holding it vertically, and letting the base dip about one-eighth of an inch in the bath, the other plate is applied against that face covered with collodion; beginning the conjunction at the lower edge; a thin film of the silver solution rises, by capilarity, to the upper part; the collodion is thus enclosed between the two glasses with a thin layer of liquid, which completely protects it from the action of the air, and keeps it in the most favorable state for the reproduction of images in the camera. The two glass plates are then taken hold of by their extreme angles, allowed to drain for a few seconds, and

placed in the frame, so arranged that the rays shall traverse the glass not coated with collodion; great care must therefore be taken to have this perfectly clean.

If the operation has been properly performed, not a bubble of air will remain between the glass plates. Plates thus prepared may be kept a whole day before being exposed in the camera.

After the exposure in the camera, and on the return home, the operator proceeds, in a dark room, to separate the plates, by introducing between them a thin wedge-shaped horn spatula, at one angle. The plates readily separate without the layer of collodion being at all damaged; then it is merely necessary to bring them to the bath of sulphate of iron or pyro-gallic acid, and treat them as usual.

I have advantageously used, for the protection of negative and positive glass plates, a varnish composed of mastic tears and spirits of turpentine; I make it very thin; it is spread over the perfectly dry glass like collodion, then allowed to drain, and dried in a vertical position guarded from dust.—A. GIROD.

Besancon, March 6th, 1853.

From the Journal of the Photographic Society.

ON HELIOGRAPHIC ENGRAVING ON STEEL PLATES.

BY M. NIEPCE DE ST. VICTOR.



HAVE the honor to announce to the Academy, that, in conjunction with M. Lemaitre, engraver I have just made a new application of the processes of my uncle Joseph-Nicéphore Niepce.

These processes are described in the official communication of M. Arago (*Comptes Rendus*, ix 256, Aug. 19, 1839).

My uncle made use of bitumen of Judæ, dissolved in essential oil of lavender, forming thus a varnish resembling in aspect the

varnish used by engravers. This he spread by means of a dabber on a copper or tin plate; and then immediately applied the face of a varnished engraving upon the prepared plate, covered it with a glass, and exposed it to light. After exposure for an hour or two, he removed the engraving, and covered the plate with a solvent composed of oil of petroleum and essential oil of lavender.

The use of this operation was to bring out the image, which was invisible, by removing the varnish from all parts which had been protected from the action of light; those parts which had been exposed to its

action having become insoluble: from this it followed that the metal was laid bare on all parts corresponding to the blacks of the engraving, the half tints being at the same time preserved.

The solvent was removed by mechanical means, by pouring water on the plate, which was dried, and the operation thus completed.

I have the honor to present two proofs which M. Lemaitre has had printed with the plates engraved on tin by my uncle; these plates were sent to M. Lemaitre from Chalon sur-Saone, on the 2nd of February, 1827 (M. Lemaitre possesses the letter accompanying them.)

My uncle's only purpose, in the principle of his discovery, was to prepare, by light, a plate capable of being immediately engraved by aquafortis, without the aid of the graver; subsequently his ideas changed, he sought to produce a direct image upon metal, of the kind now known by the name of the daguerrean image. This was the reason of his abandoning the copper-plate for the tin plate, and subsequently the tin for silver, on which he worked up to the period of his death.

I arrive now at the modifications which M. Lemaitre and myself have made in the processes of my uncle.

The steel to be operated on having been freed from grease by whitening, M. Lemaitre pours upon the polished surface water acidulated with hydrochloric acid, in the proportions of 1 part of acid to 20 parts of water: this is what he does in aquafortis engraving before applying the varnish; by this means the varnish is made to adhere perfectly to the metal. The plate must then be well washed with pure water and dried. Next, by means of a roll of cloth covered with leather, he spreads upon the polished surface the bitumen of Judæa dissolved in essential oil of lavender, submits the varnish thus applied to a moderate heat, and when dry, preserves the plate from the action of light or damp.

On a plate thus prepared, I apply the face of a direct (or positive) photographic proof upon albumenized glass or waxed paper, and expose it to the light during a length of time, varying according to the nature of the proof to be reproduced, and the intensity of the light; in any case the

operation is never very long; for a proof may be obtained in a quarter of an hour in the sun, and in one hour in diffuse daylight. Indeed it is necessary to avoid prolonging the exposure too much, for in such case the image becomes visible before the operation of the solvent, which is a sign that the proof is a failure, because the solvent will no longer produce any effect.

I use, as solvent, 3 parts of rectified oil of naphtha and 1 part of benzine (prepared by Colles). These proportions have usually given me good results; but they may be varied, in proportion to the thickness of the layer of varnish and the time of exposure to light, for the more benzine there is the more solvent the action. The essential oils produce the same effect as benzine, that is to say, they remove the portions of varnish which have been preserved from the action of light. I have discovered that ether acts in the opposite way.

In order quickly to arrest the action and remove the solvent, I throw water upon the plate so as to form a sheet, and I thus remove the whole of the solvent. I then dry the drops of water which remain upon the plate, and the heliographic operations are terminated.

It now remains to speak of the operations of the engraver. M. Lemaitre has undertaken to describe them.

NOTE OF M. LEMAITRE.

Composition of the mordant or biting liquid:

Nitric acid ..	36°	1	part (by volume).
Distilled water	36°	8	" "
Alcohol	36°	2	" "

The action of the nitric acid diluted with water and alcoholized in these proportions, commences immediately the mordant is poured upon the steel plate, prepared in the manner just described, while the same quantities of nitric acid and water, without alcohol, have the inconvenience of remaining inert for at least two minutes after contact: I leave the strong mordant only a very short time upon the plate, I remove it, wash and well dry the varnish and the engraving so as to be able to continue and bite more deeply into the metal without injuring the heliographic layer. For that purpose I use resin reduced to very fine powder; placed at the bottom of a box

prepared for this purpose, I agitate it by means of a pair of bellows, so as to form a sort of cloud of dust which is allowed to settle upon the plate, as is the practice in aqua-tint engraving. The plate is then heated; the resin forms a network all over the engraving, and it consolidates the varnish, which is then capable of resisting for a long time the corrosive action of the mordant (nitric acid diluted with water, without addition of alcohol.) It forms on the blacks a fine grain, which receives the printing ink, and enable us to obtain good and numerous impressions after the varnish and the resin have been removed by the aid of heated greasy substances and essential oils.

The result of all these operations is, that, without the help of the burin, we reproduce and engrave on steel all photographic impressions on glass or paper, and without employing the camera obscura.

The proofs which we have the honor to submit are still imperfect, but they have not been retouched: an engraver could make very good engravings out of them with little trouble.

We hope soon to attain the degree of perfection we desire; these processes, being published, will become new practical additions to the art of engraving.

OBSERVATIONS OF M. CHEVREUL.

M. CHEVREUL, in summing up to the Academy the note of M. Niepce de St. Victor, called attention to the interest he should feel in seeing if the oxygen of the air concurred with the influence of light in altering the character of the bitumen of Judæa applied to the plate, by giving rise to those slow combustions of organic substances so frequent and so perceptible when dyed stuffs are exposed to the light; for the experiments of M. Chevreul demonstrates that the greater part of the discolorations of these fabrics are not the results of the contact of light alone, but rather of the concurrence of the action of light with that of atmospheric oxygen.

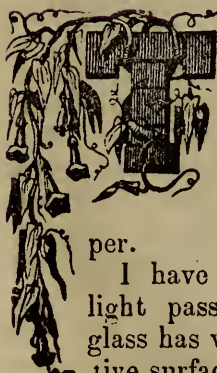
Certainly there are no facts which show more evidently than these, the necessity of taking into account the influence of light in all chemical researches in general, and in organic chemistry.

Lastly, M. Chevreul showed that the optical effects of the steel plates bitten by aquafortis, by the process of M. Lemaitre, fall into place completely under the theory he has given of silk stuffs generally, and in particular of the silk stuffs formed by the two processes of weaving which give *satin* and *sarcenet*. In fact, the *lights* of the plate correspond to *satin*, while the *shades* correspond to *sarcenet*.—

From the Jour. La Lumiere.

ON THE EMPLOYMENT OF YELLOW AND RED GLASS.

BY M. A. GAUDIN.



THE glasses I have used in my experiments are, orange-yellow glass colored in body, and the red glass which is stained, owing its color to a very thin coat of enamel of protoxide of copper.

I have established that diffused light passed through orange-yellow glass has very little action on a sensitive surface of collodion. I used the collodion of Dubois, giving a positive im-

pression of objects lighted by the sun in ten seconds, with my smallest diaphragm, which would have required a minute with the accelerating substances, *i. e.* six times as long.

Instead of masking my sheet of sensitive glass with a wooden shutter, I placed a sheet of yellow glass over it, itself masked over half its extent by the shutter, then I went out into the open air to take an impression of a view in the shade, which required thirty seconds: altogether my plate had received the light of day, through the yel-

low glass, on one half, for about fifty seconds; after passing it through the sulphate of iron, I obtained a proof pure in all parts, in which not the least inequality could be distinguished; consequently it was demonstrated that daylight coming directly through orange yellow glass, to a plate covered with sensitive collodion, produces no appreciable effect upon this, especially if negative impressions are taken, for positives are still more delicate in this respect. This experiment is still more conclusive than that I made in M. Tessier's laboratory, since I have had a perfect proof in indicating a sensitive plate, while the absence of all impression might have arisen from the insensibility of the plate.

I commenced by various trials to develop the impressions, by obscuring a portion capable of giving a positive proof; then, covering the whole of the plate with a yellow glass half masked by the shutter, and exposing the whole for thirty seconds to the direct light of the sun, I hoped to transform the positive image into a negative, in the half exposed to the sun; but I always had an image covered with a grey veil on this part. Hence it appeared evident that yellow glass could not be used as a developing agent, and that the solar rays which traversed a glass of this tint do in time effect the sensitive collodion; and consequently I made another experiment to place this beyond doubt.

Between the sensitive plate and the yellow glass I placed a negative on albumen, then I kept the whole unmoved for thirty seconds, exposed to the direct rays of the sun; after passing through the sulphate of iron I had a very pure counter impression of the negative, but it was pale and in force corresponded to a positive. From this it follows that one second of sunlight (like a minute of diffused light) would produce an inappreciable effect; but, proportionate to that time, and this leads to the important result, *that by interposing a yellow glass we may print impressions of a negative on glass, if we allow the exposure to continue one or two minutes.*—

Without the yellow glass this operation would be almost impossible, for the time of exposure would have to be less perhaps than a twentieth of a second. It has been necessary to have recourse to albumen for these reproductions on glass; but by means

of yellow glass we may henceforth substitute collodion.

Compelled to renounce yellow glass as a developing agent, I used red glass in the same way.

I began by trying its action with a negative interposed; this first essay gave me a plate gray all over. This singular result astonished me very much; it is true I had been obliged to wait a very long time for the sun to come out, and perhaps this delay might have been the cause of the veil; for this reason I immediately added a few drops of nitric acid to my silver bath, and satisfied myself, by making positive proofs, that the images came out very firm, and as quickly as before.

In these conditions, the sun shining upon the red glass, with the negative interposed, for thirty seconds, no trace of an impression was produced; but, after passing through the sulphate of iron, the plate preserved its yellow opalescence all over the surface, an evident proof that the red glass acts still less than the yellow upon sensitive collodion.

This led me to hope that it would develop; a positive proof which had received the influence of the sun for thirty seconds through a red glass over one half, did indeed exhibit a striking difference of the two halves. The developed half had the darkest parts, but it certainly was not so pure as the other half occupied by the untouched positive impression.

I cannot however yet come to the conclusion that the red glass is as unfit as yellow for developing, since I could not altogether get rid of the diffused daylight in the preparation of my plates. The arrangement of my workshop is such that I cannot avoid a half-light, which I know from experience to be injurious to ordinary proofs; it may therefore be more in developing with red glass; I shall not fail to examine this question.

It struck me as possible that a plate might be subjected to an intense light, the effect of which would be destroyed by a prolonged contact with nitrate of silver, supposing that the nitrate of silver would act in the manner of the accelerating substances which destroy the previous action of light.

To assure myself of this point, I allowed a dazzling, direct ray of sunlight to fall upon a plate covered with collodion, at the

moment I was placing it on the silver bath, I hoped to find a cause of sensibility.—After exposure in the camera, and passage through sulphate of iron, my hopes vanished, for the whole surface of my plate became as black as coal.

To produce positives on a glass by the direct rays of the sun traversing yellow glass, there is an arrangement to be followed indispensable to the clearness of the result. That part of the sky near the sun is much more luminous than the blue sky; the rays, from it, falling obliquely, confuse the image produced at a distance by

the parallel rays of the sun; from their intensity these oblique rays are not to be despised when the exposure is to last several minutes; for this reason, in order to use the direct rays of the sun advantageously, *they should be received in a dark place, after reflection from a good mirror.* This arrangement will eliminate almost all the oblique rays, and the collodion will be exposed, beyond the solar rays, simply to the diffused light of a window at the end of a room, the effect of which, as we have seen, is inappreciable through yellow glass.

GOSSIP.



we had promised ourselves the pleasure of visiting the Crystal Palace before the issue of another number to examine the gems of daguerrean art which undoubtedly grace its walls; but other more pressing duties have prevented, and as, too, our publisher has called upon us rather sooner than we expected for "Gossip," we are obliged to again defer our remarks in relation to them until our next. The brief space, also, which has elapsed since the issue of the October number, leaves us little room for new subjects for comment now—and little of interest, except what we print in the body of our work, has occurred. There is one event, however, in the history of the daguerrean art in this country deserving of a more extended notice than it has received at our hands.

Three years ago, Mr. Edward Anthony of the city of New York, offered five hundred dollars as a prize for the most valuable invention in the photographic art that

should be made during the next twelve months ensuing. Either there were no discoveries made during that time, worthy of any one's notice, and consequently none of inventive genius belonging to the art, or operators were unjust in their judgment and considered, most erroneously, that the offer of Mr. Anthony was insincere. At all events, there were none manly enough to meet his offer with the nobleness with which it was made, and no competitors appeared.

Mr. Anthony then conceived the idea of putting his liberal intentions into another form, one that would more intimately connect itself with the interests and advancement, practically, of the art itself, and a little over one year ago, offered an elegant silver pitcher and a pair of goblets for competition. It was then that the true cause for the apathy which existed in regard to the first offer, became apparent. It was asserted in certain quarters—we could name several of the small minded individuals—that the offer was insincere, and only intended as a business card to

create popularity, and that some loop-hole was open to creep out of in case competition was really offered, and that the prize would never be awarded.

It is hardly necessary for us to say, that those who were personally acquainted with Mr. Anthony could never have, for a moment, entertained even the shadow of such an idea, and the number of names sent in, of operators declaring their intention to become competitors, at once proved that this belief was not held by the more respectable portion, and we felt assured that all the best talent of the country would be brought out, and the competition close and lively. Subsequent events, however, have taught us otherwise. Many of those who announced their intention, have most ignobly "backed out," and others, who we felt assured would at the last moment, join the noble band, have failed to meet our expectations.

Now, there can be but two causes for this; either the idea above alluded to has obtained wider spread than we gave credit to the intelligence of daguerreans for, or else a cowardly spirit has taken possession of their minds, and they are willing to accord to the few who have sent in pictures a superiority they do not themselves possess—and they may depend upon it the community at large will look upon them in this light.

We do not see this lack of interest taken in national, state and county fairs—the daguerreotype department is always well represented—notwithstanding that the prize contended for is a paltry medal, worth generally, about five dollars, or merely a diploma. Now, why is this? Let us speculate a little and reason upon incidents and facts that invariably transpire on these occasions, and it may solve the riddle.

The Anthony prize is not only a magnificent one, but most honorable and talented men have been appointed to award

it. There is no chance here for "log rolling," or of picking a jury, the bias of any one of whom might lean to this or that competitor, and therefore, nothing can be made in that way; consequently those who wish to avail themselves of such influence, and depend more upon it than their own merits, have not thought it worth while to take any notice of it.

The incidents that have occurred for the last five years at the fairs of the American Institute in this city, the Franklin Institute of Philadelphia, and the state and county fairs, abundantly prove that influences of this kind have been always, more or less exerted, and in some instances have prevailed. Even the "World's Fair" exhibition has not been free from the imputation, and if certain men had been suffered to have their will in the matter, we should not have considered the opinion of the committee of much value.

Again, the award to the competitors, for the prize pitcher is to be made entirely upon the merits of the daguerreotypes presented. No names of acknowledged talent can possibly present themselves to turn the judgment in the estimation of a fair—the producer of the daguerreotype is as a sealed book to the judges, until after the decision is made—the most minute detail must be studied and commented upon—the faults and excellencies of each must be given to the public, in order that they may know upon what grounds the decision is founded, and to prevent the least murmur of disapprobation, and the slightest cause for animadversion.

Not so is it with the decisions of Fair Exhibitions. The judges award their prizes to those they pronounce the best—all other exhibitors are as mere nonentities, not worth a thought. However, those who get the medal or diploma, can "blow" upon it, for at least a year, or until some other similarly favored—for who ever

knew the same competitors to obtain the same prize at two successive Fairs. The political principle of "rotation" is admirably preserved. These prizes are therefore, ephemeral, while that of Mr. Anthony is a lasting monument of success. Is it not strange then, that so many who are known to stand high, not only in public estimation, but with all who can appreciate true art, should neglect such a golden opportunity, and can we attribute their refusal to strive for such a prize to any other causes than those we have named. We gave many of those gentlemen, men whom we esteem as such, and as the best in the art, to understand that we should be severe upon them if they with-held their contributions, and as we never fail to keep our word when it is in our power to do so, we have said thus much in fulfillment thereof. We could be more severe, but we consider that the future will reveal to them the unwise position they now hold, and that what we now say, and have said throughout our editorial career, is and was intended for their good. We are abundantly aware, that, for ourselves, a less bold stand, and more mealy mouthed expressions would be more profitable, but we desire the elevation of the art, and whatever may be thought of our career, we feel conscious of never having set down aught in malice.

The decision of the judges was made on the 22d inst., and their report will be published in our January (1854) number.

— In another portion of this number will be found a letter from one of our fair correspondents, in regard to the N. Y. State Daguerrean Association, which conveys a merited censure to every daguerreotypist in the state. We are assured, that—with the exception of this lady—there was not a single member in attendance. We will not suffer ourselves to comment on this fact, for we are sure that

we shall say things we would be sorry for ever after. But in silence we will suffer the shame to rest upon every individual member. Their own thoughts must condemn them.

— As the decision in regard to the prize pitcher has been made, the following poem, clipped from the N. Y. Evening Post, can have no influence, and we publish it as a tribute from one of our sweetest poets.

TO HELIA,

On seeing one of the pictures, sent in for the \$500 silver pitcher prize, so liberally offered by Mr. E. Anthony, 308 Broadway, N. Y.

Well may the sun be sire of one like thee,
 Impersonation of Celestial grace:
 Less of divine and bright was in the face
 Of new-born Venus rising from the sea.
 Daughter of Light! upon thy breast appears,
 A star less radiant than thy lifted gaze,
 That seems to pierce the distance, veiled in haze,
 And read the riddle of coming years.
 The musing bard in inspiration's hour
 A glimpse of nobler features never caught—
 Blending the charm of deep poetic thought
 With beauty's wild and overmastering power.
 Fair pictures crowd the galleries of old,
 But boast no shape of such a lustrous mould.
 Avon, Oct. 29, '53. W. H. C. HOSMER.

—The Chicago Democratic Press thus speaks of the fine art matters connected with the Illinois Mechanics Fair, held in that place.

Let us leave the tables for the present, and run an easy eye along the walls. It rests first upon a painting of water colors representing the interior of a church in Normandy, in the antique Gothic. The picture is the production of F. G. Kruger, and is an achievement of which he may well be proud. An accurate perspective is maintained amid the multiplication of columns and aïcles, while even in the subdued light, the mouldings and carvings are delicately delineated, the saints in the niches are discernible, and the Christ upon the Cross, above the grand altar where the priests are officiating, is seen in the distant dimness of the solemn arches. The same artist furnishes a shipwreck scene also in water colors, which bear no comparison to its fellow. The Young Angler, by Mrs. C. N. Holden, the Landing of the

Pilgrims, and miniatures on ivory, by Mrs. S. M. Wilson, are very creditable. Mrs. Stickney's pupils give evidence in their contributions of their teacher's ability and their own proficiency. Miss Ada Lavinia furnishes four pieces in water colors which are very well done. We notice other contributions in the same line, which have doubtless afforded the fair authors much pleasure and which add much to the interest of this department. Four pieces by Miss Maria Westervelt, one by Mrs. Willard, and four by Miss Mary E. Parker. There are several attempts by new beginners, little timid ones no doubt, which, after hours of labor less represent a real existence, than would a few strokes by a practiced hand, yet we would not have them denied a place in the Fair for the whole receipts, for who can tell the fluttering of their little hearts as they entered their contributions, the bitter disappointment they would have experienced if there had been no place for them, or the swelling consciousness of a new life, as they now feel that the public eye rests, even momentarily and carelessly, upon the result of their early labors.

Among the oil paintings, a portrait of a little son and daughter of Cyrus Adams, just completed by Thomas Stanton, is the best. The little boy is playfully decking his sister's hair with flowers, and she looks as happy as a queen. The likenesses are said to be fine, the expression of the countenances is in good keeping with the arrangement of the piece. A portrait by Mrs. Saberton is exhibited, which will add to her previous reputation, Mrs. E. S. Warner contributes a highland scene; E. Montell two river views, rough but striking; some excellent landscapes by Misses Sarah and E. Huntingdon; Mrs. Jennette Cooban exhibits a number of meritorious drawings and paintings; Mrs. George A. Meech contributes a water view and a garden scene, well executed, and a Madonna which viewed from a distance, in a strong light, is very admirable. There are monochromatic sketches by S. M. Henlee, James Wilson and E. A. Wemple. A crayon portrait, by Mrs. E. N. Brackett, is well taken.

One end of the Hall is almost taken up with the display of daguerreotypes, arranged in groups by the respective artists.

Of these are some very superior ones by Alexander Hesler, of Galena, Illinois. His thorough understanding of the means and method of producing a good daguerreotype is shown in the rich, heavy tone of his pictures. But the position and arrangement of his subjects, showed the genuine artist. They are all relieved from that vacant staring look, which is the bane of common daguerreotypes. The "Veiled Lady" is perfect; and we have never seen so fine a head as that which occupies the plate in the centre of his frame. The artist who can produce such pictures with the "pencils of light," can rarely fail to more than satisfy those who sit for a likeness in his gallery. J. H. Taylor, of Springfield Ill., exhibits specimens of his skill. The prominent artists at our own city have sent in fine collections; C. C. Kelsey, P. Van Schneidau, W. G. Chamberlain, H. P. Danks, E. G. Stiles and Miss Miller. Not a few remark some beautiful drafts of steam engines by W. McCammon. Lithographs are shown by E. Mendell, and F. Stoltz. The latter exhibits specimens of stained glass, of his own manufacture. Our eyes are weary with looking up, and we will therefore take a look at the tables again to-morrow.

— Mr. C. C. Harrison has recently introduced two new sizes and styles of camera, of very superior quality; these he calls the extra half, and extra whole. They possess many advantages over the ordinary sizes, the most prominent of which are in giving sharper outlines, more roundness of form and a clearer image. We can safely and cordially recommend them to our daguerrean artists. See Mr. Anthony's advertisement.

— The Messrs. Meade were awarded the gold medal at the late Fair of the American Institute. Mr. Gurney a diploma, he having been awarded the gold medal last year. The Messrs. Meade have lately been elected honorary members of the Academy of Science of France.

— Fine specimens of the photographic art, both of the French and English school, can be purchased in New York at very

reasonable prices, much cheaper than engravings of the same size. Some of these are very beautiful, and well worth the price asked for them. The Messrs. Trubner of London, our agents for the Photographic Art-Journal for Great Britain, are publishing a series of photographic prints, which commends itself to the lovers of fine pictures. Mr. Anthony, 308 Broadway, N. Y., is appointed to receive subscriptions.

DAGUERRE.—Dumas says, that while a lecturer on Chemistry in the *Theatre de Sarbonne*, some time in 1825, he was accosted by a lady, at the close of one of his discourses, who anxiously inquired :

“ Monsieur Dumas, as a man of science, I have a question of no small moment to me to ask you. I am the wife of Daguerre the painter. For some time he has let the idea seize upon him that he can fix the image of the camera. Do you think it possible ? He is always at the thought ; he can't sleep at night for it. I am afraid he is out of his mind. Do you, as a man of science, think it can ever be done, or is he mad ? ”

“ In the present state of knowledge,” said Dumas, “ it cannot be done ; but I cannot say it will always remain impossible, nor set the man down as mad who seeks to do it.”

This was twelve years before Daguerre worked his idea out, and fixed the images ; but many a man so haunted by a possibility has been tormented into a mad house.

T. D. S., OHIO.—The cost of apparatus for taking photographs on glass and paper varies with the size. If you have a camera, shields can be supplied by Mr. Anthony for the box by your giving him the dimensions and the focal distance of ground glass. The solution dishes, cuvettes, paper, chemicals, pressure frames, &c., can be supplied at from 20 to 50 dollars, according to size and quality.

— J. S. W., of S. C.—Your box is nearly done. Mr. H—, to whom I told you I loaned it, thus writes regarding it :

“ My first efforts with it were not as successful as I could wish, but a few weeks since I tried a few experiments with it, which led me to others of great importance, and most encouraging to the issue of my

invention. I cannot express how much I am indebted to that box, and in parting with it, I certainly wish it many days of future usefulness, and its inventor much prosperity.”

— We call the attention of our readers to our PROSPECTUS (on the cover) for 1854, and would solicit their exertions for the future advancement of our Journal, both in quality, by contributing their experience, and in usefulness, by extending its circulation. We would also request all who are still in arrears to make immediate payment, and notify us as to the edition to which they wish to subscribe next year.

— A. H., III. Many thanks for your letter. We trust you will carry out your kind intentions in regard to us in any event. A treatise from you would be valuable to your brother artists.

— We call attention to the advertisement of Mr. Follett. The long experience and known ability of this gentleman is sufficient to recommend any article he may produce in daguerrean chemistry. By an oversight of the compositor this gentleman's name was erroneously printed Gunn.

— The communication of F. D. B. R. came too late for this number, but will appear in our next. We have investigated the subject of which you spoke to us when here, and we find the fault is not with our publisher. The numbers have twice been mailed to you, and there must be some villainous process going on in the post office department on the southern route, for not only you, but all our southern subscribers make the same complaint. We do not see why publishers should not recover damages from the U. S. government, for such outrageous wholesale robbery.

— We are sending circulars of our *Prospectus* for 1824 to all our subscribers, and we hope they will do us the favor of circulating them, and endeavor to add at least, one subscriber to our list. It will be perceived that, it is our intention to make the work equally interesting to those out of, as in the profession, and this may enable them to increase its sphere of usefulness more readily.



PERKIN'S INSTITUTION FOR THE BLIND, SOUTH-BOSTON.

THE PHOTOGRAPHIC ART-JOURNAL.

Vol. 6.

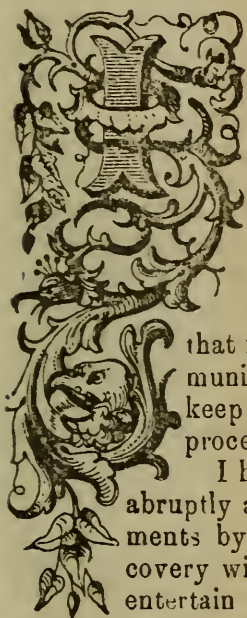
DECEMBER, 1853.

No. 6.

SPIRIT OF LA LUMIERE.

Translated for the Photographic Art-Journal, by W. Grigg, A. B.

THE NEW QUICK COLLODION OF BERTSCH



In a late letter which you have seen fit to insert in your valuable Journal, giving you the analysis which I had made of English collodion, I remarked to you that I intended making some experiments to improve this production, and that if you deemed my communications useful I would keep you informed of my proceedings.

I had no idea of being so abruptly arrested in my experiments by indisposition; the discovery with which I am about to entertain you, not being mine, you will allow me to pass rapidly over lengthy details into which I propose entering.

A collodion has just been invented which *instantly* reproduces the images of the camera obscura

The inventor M. Bertsch, is a man distinguished as well for his knowledge as for his modesty, who consecrates to the arts and sciences the few moments left him from the arduous duties of a public officer.

M. Bertsch has for a long time obtained photographic paper images by the solar microscope. A more curious collection than his cannot be possessed. It contains transversal sections from our principal species of woods, on which the divers forms which effect the serous vessels may be thoroughly studied. It initiates you also into the mysteries of the anatomy of insects, and if one is amazed in analysing the me-

chanism of the trachea of the silk worm, and that of the shell of the butterfly, counting the innumerable facets of the fly's eye, he is alike so terrified at the sight of a wasp's sting, and at the still more frightful claws and mandibles of the spider, that it is almost with feelings of pleasure that the eye reposes on fleas, lice, and other such parasites nearly four inches in length. Ingenuity will draw a very useful portion of the reproduction, by the same means, from every textile matter, from downs and hair as well in the vegetable as in the animal kingdom.

By the magnified image of photographic animalculæ geologists will be enabled to set themselves right in regard to the marine, lake or pluvial origin of certain earths.

It was, by giving himself up to those interesting studies, that M. Bertsch arrived at his discovery. To obtain the image of the animalculæ contained in a drop of water, animalculæ which are endowed with extreme mobility, there was necessary a preparation which should be sufficiently sensitive to reproduce them suddenly in the midst of their disordered movements.—His collodion enabled him to attain this end, for I again repeat, it gives *instantaneously* the images of the camera. For the rest, this collodion is similar in appearance to others; it is employed absolutely in like manner, and like them also it renders necessary the bath of nitrate of silver. The only precaution to be taken in pouring it on the glasses, consists in operating in an apartment out of the influence of all light other than a taper. This *last* even should be much deadened, for the flame of the taper might be reproduced upon the glass.

M. Bertsch himself possesses, and has already presented to numerous enthusiastic

amateurs, images of lighted tapers and lamps. Lastly, which will thoroughly demonstrate to you how sensitive is this collodion, by its means carriages in motion, clouds, the setting sun, and even the image of the moon, have been reproduced. It will be necessary then, in employing it, to avoid all diffused light. In a camera not perfectly close, or where the tablets do not shut well, the collodion *will veil* before receiving the impression of the object which it is to reproduce.

It has been tried in every known apparatus, and always with the same success.—With the larger object-glasses, in shadow and within doors, the exposition cannot go beyond two seconds, but it is in the compound glass apparatus, and with a focus 27 1/5 to 9 3/4 inches, that it acquires its highest degree of sensibility.

This last is such, that the hand not being able to cover the object in a sufficiently rapid manner to prevent the image from being *burnt*, recourse was obliged to be had to a mechanical obturator. M. Bertsch has invented some highly ingenious ones.

All portraits, and photographic portraits especially, have this in particular, that the person which they represent has an air, either rough, serious, or insipid, which he does not naturally possess. This arises from the fact of his having been *positioned*. Now, there is no need of positioning with this collodion, since your picture may be taken whilst you are speaking, at the moment when you are the most indifferent in the world as to what is passing around.—You are reproduced with your ordinary physiognomy, your natural air. It cannot be otherwise; judge of it yourself. The person whose portrait is about to be taken, being placed at some distance before the object-glass, the operator, even while conversing with him, releases the trigger, like that of a gun. The obturator turns rapidly upon itself, and, in its circular movement, permits the light and the image of the person to pass through an aperture which it carries, and which has a diameter double that of the object-glass. The portrait is obtained, and the fraction of a second of which no account can be taken has been employed.

This instantaneousness of reproduction resembles in spite of itself, the transmission

of the electric fluid, and cannot be compared to aught but it.

It is useless to inform you that the image withdrawn from the camera, is carried to the reducing baths, generally employed, of sulphate of iron or pyrogallie acid, as the artist may choose, then passed to the water, and lastly to the hyposulphite, etc., just as ordinarily.

M. C. Baron Seguier, of the academy of science, M. Glerget, to whom we are indebted for the optical saccharimetry, M. M. Glaize, Decaisne, Beranger, etc., distinguished painters, M. Desclaux, a talented engraver, and a large number of artists, of savants and photographic amateurs, have been witnesses of the facts of which I speak, and have been as surprised at the results obtained by M. Bertsch, as happy to express to him their satisfaction.

Truly this collodion is perfect, and that which I have tried has given me with unheard of rapidity very beautiful negatives. My first trials were fruitless, because knowing that I must work very quickly, I was still too slow; I gradually reached it, and now even in the raw and hazy weather, we have every morning, I obtain, as I told you, very fine negatives.

This collodion keeps blue on the glass, and is sufficiently dry at the expiration of a few days to be wiped with a piece of fine linen.

This results in the removal of a powdery coating which leaves the reduced silver exposed and polished, so that a beautiful negative is thus changed into a superb positive, as unchangeable as those obtained on the silver plate.

The collodion of M. Bertsch will especially excel for portraits of children, animals and every object which cannot be obtained in a state of rest.

The precautions to be taken to preserve it are similar to those employed for the preservation of other collodions. Then it will keep all its sensitiveness as long as its density is not changed by leaving the flask which contains it a long while open. It appeared to me to be better at the end of a few days than when it was fresh.

Lastly, I have remarked that it has the advantage of not *burning the white*, and to preserve harmony between the white portions of dress.

As a chemist, it was my duty to find out

what substance composed this collodion; I perceive all those mentioned in recent receipts, save the silver, and when I wished to reproduce it, I obtained nought but ordinary collodion. I brought my results under the scrutiny of M. Bertsch, who assured me that the great sensitiveness of his collodion was owing wholly only to a peculiar molecular state, which he was not always able to reproduce.

The fact is that I saw him try many specimens of this chemical recently made, on which by the look alone he designated that which would be good, that which would look slow, and that which would be bad, all of which were afterwards proved true by experience with the camera.

Science will doubtless explain the curious phenomenon. I limit myself for the moment to proving the facts and in joining my complaints with those which the inventor of this precious discovery has already received.

Now that the collodion is going to be commercially diffused, a great number of observations are going to be made by our most skillful photographers, who will not fail to make you acquainted therewith.

I shall always esteem myself happy for having called your attention to this curious production, and ask you the permission to keep you in the train of all new facts or discoveries which I may make or which may come under my knowledge.

Accept &c.,

LEON KRAFFS.

Chemist, pupil of M. Guy Lussac.

M. PLANT'S DRY PAPER MULTIPLE SHIELD.

You have desired of me a description of my multiple shield *a' papier sec*, designed for travelers and for all who may wish to take a large number of views without the fatigue and trouble of seeking a shelter, sometimes impossible to find, to effect the transmission of the sheets, which is done in a clear light and full sun. I hasten to gratify your desire.

This apparatus is composed of a box about two inches thick and of the size of the paper which is to be employed; this frame, (*boite*) notwithstanding its thinness is double, by means of a partition in the centre, and one has only to reverse the shield to have on one side a proof box, and

on the other the paper all prepared. In this last side thirteen ribbons designed to retain the sheets are drawn one after the other each time a new proof is to be made, and letting fall a sheet of paper into the shield. These thirteen ribbons coming out on the outside of the shield, the operator can always know how many sheets he has yet to use. Two pieces of wood, one having a spring, press upon the ribbons on their exit from the shield, and the form of an S which they take is to prevent all light from penetrating the interior; the whole is covered with two lids with grooves which only open for the pages of the paper, and which are closed by two small copper swivels which prevent them from opening during the manipulations. The other portion of this tablet, which goes into the camera, is only, properly speaking, an ordinary daguerreotype shield, with the exception of a stationary piece of glass, designed to hold each sheet of paper, forms the bottom, and two grooves placed upon its sides allow a lid to enter them, as well as to push down the paper box at the moment when the latter has deposited therein a sheet of paper, to be pushed up by it when the proof is made to allow it to fall into the proof box; lastly, a screw button placed on the back of the lid and from a recall screw causes a small press covered with velvet, designed to keep the paper under a proper pressure during the operation, to avoid the inequalities.

MANNER OF FILLING THE SHIELD.

The method of putting the paper into the shield is as follows: Press with the two fingers upon the head of the springs, at the same time draw the cover, taking it between the teeth, then remove the two pieces, (one of which has a spring,) which forms the entrance of the ribbons, and after having cut and rendered the paper sensitive in the dark, it is introduced sheet by sheet into the tablet, the prepared side uppermost, separating each sheet by a ribbon which is passed by its turned end into the screw designed to hold the ribbons on when a number equal to the number of sheets to be used have been put in, the pieces are returned to their places, the cover is put in, pressing with its extremity, in order that it may enter the grooves, and it is closed by a swivel. After having placed

the fifteenth sheet of paper into the shield in the dark room it is pressed by the aid of the screw button. All is then ready to work.

MODE OF TRANSFERRING THE OBJECTS.

Once in front of the object to be reproduced, work as ordinarily with the first sheet enclosed beforehand in the camera shield, then having taken the shield in the hand, the proof once made, unscrew the button in order to raise the press in the shield and push this last up with the proof box which takes its place; the box once over the impressed* sheet reverse the shield with the box joined to it, open the cover, and the sheet of paper falls into the proof box, the cover of which is then pushed back and fastened with the swivel.—Nothing now remains in the camera shield, and to furnish it again with paper, return your box, which introduce, this time, into the grooves of the side where your prepared paper is, then after having drawn the cover, it will suffice to pull out a ribbon, that a new sheet may fall into the shield; shut the lid, push down the box with the shield; press the paper with the screw button, and you have nothing to do but complete your proof, which is withdrawn as before and takes its place in the proof box.

This operation, which may, perchance, seem lengthy in type, is completed in a few seconds, and the apparatus is so constructed that no light can change the proofs during the manipulations.

HENRI PLANT.

Patentee inventor of the multiple shield *a' papier sec.*

FIXING BATH.

I have just read with lively interest in the 38th number of your valuable journal an article concerning the fixing of positive proofs; I agree with the opinion of the author touching the slight solidity of positives, notwithstanding all that has been said on this subject, I will add that it is almost impossible, by the ordinary means, to obtain two proofs of perfectly identical tones; where one has even completely obtained them, they change on removal from the fixing bath on drying.

Permit me to communicate a method

* *Impressed*, changed by the light.

with which I have been perfectly successful, and which I have made use of for years, without even having occasion to complain of the solidity of my proofs. It is a bath which I have styled, *fixateur de Metz*.—It costs almost nothing, since one may use old baths which have carried away ioduret of silver from his plate, supposing even that it contained alcohol. This bath gives the tone of India paper to the proofs on positive albuminated paper.

To use it, the proof is allowed to obtain a tone rather more decided than is wished, which will be necessary for its washing in two or three ordinary waters. This operation of washing lasts about five minutes; the proof is afterwards plunged in the fixing bath which I am about to describe, and, without fear, the operation may be completed in full light, for the proof fixes instantaneously, if the hyposulphite be not too weak.

If the proof be rather too decided, it will equalize by leaving it over ten minutes in this bath, the proper time for completely fixing a proof.

This fixing bath may be used an entire day; but it is rare that it is found good the next.

The proof having reached the exact tone desired, it is rinsed in two or three waters, and dried between a number of sheets of bibulous paper. The whole of this operation of fixing, as is seen, lasts but a quarter of an hour; aqua-tinta blacks are obtained upon the paper previously albuminated, and on the salted papers, or ordinary positives, the blacks are always of the tone of India ink or engraving; if the bath of azotate of silver, which has been used to prepare the sheet, be not too weak. I find that photography is expensive enough to those who occupy themselves with the art, without trying to augment the expenses; all my efforts tend even, on the contrary, to diminish them.

Composition and Net cost of the *fixateur de Metz*.

Spring water	900 grains	
Hypsulphite of soda..	90	cost $\frac{1}{2}$ cts
Ord: white vinegar ..	900	" " 3-4 "

1 1-4 cts.

In fixing ten large size proofs, one may still be economical with this moderate

priced bath, by using, as I have said, the old baths of hyposulphite of soda. As I suppose your subscribers will do me the honor of trying the bath, which will cost them so little, ask them in return a single favor, not to rechristen my *fixateur de Metz*.

I should be in despair if it should receive the sobriquet of vinegar bath. Will you make what use of the present you may deem proper, and receive the assurance of my very distinguished consideration.

CASIMIR OULIF.

MADRID CORRESPONDENCE.

It is with lively interest I have read in the last number of *La Lumiere* the name of M. Pucher, and his communication to the Academy of Vienna; I have been enabled to obtain his acquaintance, perhaps am the only Frenchman who has been able to appreciate his talent, his perseverance in researches so much the more difficult as living almost in a desert, he was without the resources necessary to the work of experiments.

Perchance you will read with some interest what I know and what I have seen relative to this modest and highly intelligent gentleman.

In 1849, while residing at Trieste, as member of the Consulate of France, I was obliged by my physicians to take a change of air, and sent to Veldes, in the Carniole (Ober Krain). It was then I saw M. Pucher, the officiating priest of this small borough situated at the top of a perpendicular rock, crowned with a picturesque castle belonging to the bishopric of Brixen, and reflected in the deep blue waters of a charming lake, in the bosom and on the snowy summit of thickly wooded mountains.

Conversing on art and the daguerreotype, he showed me proofs which excited in me feelings of astonishment, so much the more great, from the fact of the processes on glass being almost unknown. I hastened to purchase some of these proofs, and I have had the pleasure of since showing them to a number of persons; in Venice, to M. Eugene Piot, who was then there; in Paris, in our galleries, to M. M. Lawson, and Deschamps, &c.

In operating he only employed a 1-4 object

glass, not being able to purchase a larger, and used simple pieces of window glass. He was very reserved as to his mode of operating, but he many times told me (and the same thing was repeated to me by the steward of the castle who saw him operate) that he employed no solid body, using only gas, without the glass undergoing any previous preparation, and that after many experiments he had obtained the pure blue of heaven. As to the delicacy of the details, the opposition of the clear and dark portions, the impressed plates offer a very remarkable peculiarity; which is this, placed in direct light, no trace of design is distinguished; also too, if they be laid flat on white paper, they have the same appearance as ordinary window glass; but by placing a black reflector at a certain distance, or by regarding them obliquely to the left all the details of the impression comes out distinct and luminous. I have in my possession four proofs; one of them reproduces the view of the chateau, the rock and a portion of the lake.

The tone of the sky is in fact blue, but not that warm blue that I have admired in the plate proofs of M. Niepce de Saint-Victor; this tone, I should also say, is that which predominates in the proofs of M. Pucher and which particularly affect the whites, which arises, I think, from the sulphurous vapor. Two other plates reproduce the Rectory of Veldes, the Malner hotel where I lodged, and which, as also the trees were reflected in the lake in the most exquisite manner.

The last, and the most remarkable, reproduced a tomb surmounted by a funeral urn of white marble; the long inscription in the Slavonic language is of a purity, a clearness most wonderful. He showed me another proof of the same tomb, against which a peasant in white costume is leaning, the whole perfectly brought out. The proofs when fixed are placed under another glass, glued to the four corners, and in examining with care, I believed, without affirming it, that on the sensitive glass deposited a transparent coating like that given by either albumen, gum, or any other transparent substance. M. Pucher told me that the impression attacked the body of the glass and was indelible; consequently, I trust rather to what he told me than what I believed. I saw myself, hav-

ing no reason to depreciate an invention in my opinion admirable in all respects, and worthy of exciting the interest and aid of the Austrian Government.

This, is what I had to say to you of a man whose name perchance could figure among those of the most skillful photographers, if he were not chained to the poor Rectory of Carniole, and debarred of "La Lumiere."

Make what use of my letter you may think proper: but I have hoped to interest by these details. As to my labors here, I have obtained some beautiful proofs and copies of Velasquez and Murillo, which I hope, are worthy of my skillful professor, M. Ferrier.

Accept, Sir, the assurance of my high consideration.

VT. LOIS DE DAX.

TRANSPARENT PICTURES ON GLASS, BY PUCHER. CHEMIST, VELDES (OBESKIAIN, AUSTRIA) (*extract du compte rendu des sciences de l'Academie des Sciences de Vienne*)

The transparent pictures on glass, I have obtained have, I acknowledge, but a feeble importance, when compared with those of the daguerreotype and Talbot photographs; the path on which I have entered being new, they are not unworthy the attention of photographers; especially in consideration of the insufficiency of means in my power; an insufficiency which is the cause of these pictures being less perfect than they otherwise might be. My process is particularly adapted to the reproduction of plastic architectural subjects as also, lithography and engraving. It is also suited for the obtaining of aerial perspective, the tones voluntarily modifying themselves in certain cases, sky blue, among others, of which it gives the transparency; the pictures obtained by my process possess a great advantage over the ordinary plate proofs, the skies of which are dull and cold, and which, besides, have the defect of being inverted. The plate of common window glass, or better, yet, the polished† is covered by the breath with a film of vapor, afterwards rubbed lightly and for some time

with a piece of soft dry linen, then moderately treated.

The sensitive coating is spread upon the plate which is afterwards held, the coated side under, at three inches above a lighted stick of sulphur about the size of a match, prepared for this purpose, and held by a tube in which it is fixed. A short time after, the plate is found covered with a pearly white tint, changed to a reddish brown by the action of the light.

The stick of sulphur is prepared in the following manner:—Take a small piece of pith, which has been steeped in fused sulphur to which add a little mastic; it then becomes entirely covered with a coating similar to that of matches; introduce at one of its extremities a pin of yellow copper fixed in the middle of a tube ready to receive it, then light it.

The plate, rendered sensitive, is placed in the camera, and exposed to the action of the light a minute.

During the exposition, the particles of mercury, which rise from an iron vase, placed on the bottom of the instrument, fix upon the part affected by the light. The mercury is not absolutely necessary; I have obtained pictures without this agent, by another process.

Withdrawn from the camera, the plate shows but the feeble outlines of a picture, but comes out instantly with the vapor of bromine.

The plate is then held over alcohol, which is afterwards poured upon it, this wash brings the image completely out which becomes very clear; 5 to 8 minutes are sufficient for the whole operation.

The substances, I have employed are so sensitive that the prepared coating changes its aspect instantly; in the direct light of the sun a recognizable image is obtained in five seconds. If the plate be placed in a book or on a wood engraving, five minutes are sufficient to complete it.

Here, besides, are a few explanations on the value of photographic glasses as a method of transmitting the image to paper.

The plate is spread with a solution of gum and exposed to the fume of iodized sulphur; it furnishes by the camera a rough positive image, with all its details, the outline of which are cut out as with a graver which attacks the coating through to the glass.

† The polished slab or ivory plates, perhaps, also lithographic stones, as well as metallic plates covered with gum or varnish cement, may be made useful in the same process.

The plate thus engraved, is then rubbed with printer's ink, and the lines become filled with this ink, which covers it, the ink in the lines alone remaining; and the design is then transferred from the glass to the paper by simple pressure, with a folder, or any other analogous instrument.

PROCESS

To obtain proofs on iodized plates, with chloride of sulphur without the use of mercury.

BY J. NATTERER OF VIENNA.

M. J. Natterer has made, in conjunction with his younger brother, different chemical and optical experiments, of which he has communicated the results to an assembly of savants and physicians of Mayence, by a memorial which has just been published in the *Botgers Polytechnischen Notizblatt*.

We extract from this memorial which in view of the photographic art, cannot fail of being truly interesting to our readers.

The silver plate is iodized in the usual manner, then placed in a vessel 6 or 8 inches high, at the bottom of which in a small cup, are a few drops of chloride of sulphur; it remains exposed to the action of the vapor which is disengaged therefrom, until the dark yellow hue is changed to a red; after which it is placed in the focus of the camera, where it is left for a time which varies according to the luminous force of the object-glass. With the object-glasses of Petzval Voigtlander, not less than 10 seconds and not beyond 2 minutes.

The plate is then withdrawn and examined in the dark chamber, by the light of a taper. It often happens that no trace of an image is yet perceived upon it; but if the plate is warmed by placing it over a spirit lamp, on the side which has not undergone any preparation, or if it is exposed only a few seconds to a feeble subdued light, the positive image then appears with all its clouds. The proofs thus obtained have such a delicacy of tone and detail that they surpass in this respect the ordinary daguerrean proofs. The best of these three methods of procedure for bringing out the image is always the second, which consists as I have just said, to deposit the plate in a dark place and to examine it from time to time; the plate being heated, or simply submitted to the moderated

action of the light; it often happens that the image, which then appears too rapidly, disappears more promptly yet and before one has been able to fix it.

When the plate has been exposed in the camera for 10, 20 or even 30 seconds, still the image is not visible when withdrawn; one of three methods above mentioned is also to be employed to render it apparent.

If the plate is left 2 or 3 minutes in the camera, the image is complete when withdrawn.

With the object-glass of Petzval-Voigtlander, whose camera has an opening of $1\frac{1}{2}$ inches, and a focal distance of about 5 inches, the time of exposition of the plate necessary to the reproduction of the subject illuminated by the sun, cannot be less than 10 seconds, nor over two minutes; for in the first case, no action would yet have taken place, while in the last, the imprint of the image already vanishing, would leave nought on the plate but a feeble trace.

When the plate is left but 10 seconds in the camera, it is often necessary to leave it in the dark for 15 or 20 minutes until the image be perfectly brought out. It is hence conceivable that if the action of the light has lasted more than 10 seconds, the image is produced more quickly in the dark. The images obtained are white and black and passes, as well as the daguerrean proofs, through all the intermediate shades; it is also a matter of indifference, with respect to the beauty of the tones and their intensity, whether to leave the image to form itself entirely in the camera by a long exposition to the light, or to withdraw the plate sooner to bring out the image by the aid of one of the three operations above described.

The advantage presented by this new method of operation for obtaining photographic images over those in use at the present day, is easy to understand. To obtain ordinary daguerrean proofs, the time prescribed for the exposition in the camera should be observed to near a second; which is very difficult in cloudy and overcast weather, especially with the essentially variable intensity of the light, whilst this difficulty does not exist in my manner of procedure. The two extreme spaces of time 10 seconds and 2 minutes, between which the image should become visible, are so dis-

tant the one from the other that no apprehension can be had of the success of the operation. On a dark day, these two extreme terms become naturally changed and 30 seconds at the least and 3 minutes at the most are then necessary to obtain a proper result.

It is still to be remarked that the bromide of sulphur, rendering the plate more sensitive has power when it is employed of diminishing relatively the time of exposition to from 5 seconds to 1 minute.

One will then be able with a good object-glass, to obtain a superior proof in 10 seconds, as the object is or is not illuminated by the sun, if the heavens be clear or overcast, a thing completely impossible with the daguerrean process, as every photographer knows. That the image may be produced entirely in the camera, or that it may be rendered visible by one of the three operations which have been considered farther above, the plate is washed by means of a solution of hyposulphite of soda, then covered with warm distilled water; and the ulterior of the light cannot then cause it to undergo any alteration.

I cannot conceal, that however vigorous the proofs may be before the wash, the latter might not cause them to lose a portion of the intensity of their color; but by compensation, they gain in beauty, what they lose in vigor, and their shades take then a beautiful brown tone equal that of sepia.

If the plate is washed with a cold solution of kitchen salt and the plate touched a certain length of time with a bar of zinc, the image entirely disappears.

I do not for an instant doubt that these new photographic proofs may be brought to (as other liquids may be substituted for,) the liquid which I have employed for the wash, much greater perfection.

In such various and multiplied experiments to which I have applied myself till to-day, I have seen no phenomena so surprising as the appearance of an image upon the plate, leaving no trace whatever of any image a few minutes after the plate has been deposited in some dark place; this action commenced by the light continuing in the dark, when the operating can no longer exist.

CH. BANCHAS.

ON THE EMPLOYMENT OF THE SULPHATE OF AMMONIA—OR SULPHOHYDRATE OF AMMONIA AS A FIXING LIQUID.

BY J. POHL.

(*Extract du compte rendu des sciences de l'Academie des Sciences de Vie ne.*)

During the month of May of the year 1847, I was occupying myself, by way of pastime in copying machine models by means of photography. I conceived the idea of trying the action of the sulphate of ammonia, which contains an excess of sulphur in solution, upon a proof produced by means of gallic acid, and already fixed with hyposulphite of soda, in the hope of transforming brown tones to blacks, by the formation of sulphate of silver.

The previous treatment which the paper had undergone was such, that no part of the chloride of silver could form upon it. The liquid which I employed contained, in weight, thirty parts of water to one of sulphate of concentrated ammonia. I left the proof to steep in it about ten minutes, and washed it carefully with water. The primitive color of the image, which was a reddish brown, was effectually changed into a beautiful dark brown tone, as I had desired, and that without the proof having suffered thereby.

In the hope of obtaining tones still more black, I employed the vapor of concentrated sulphate of ammonia, upon a proof produced in the same way as the preceeding; but the coloration of the proof, was quite different from what I expected, instead of a decided black tone, I obtained, in about eight minutes an image of a peculiar fawnish hue, which ever preserved its whole delicacy. Repeated experiments always gave me the same result.

It then rests established that one may at will, and notwithstanding previous fixation of the photographic image by means of the hyposulphite of soda, obtain proofs of two different shades; one a black brown the other fairer or reddish, by employing sulphate of ammonia at a proper degree of concentration. I tried, in identical circumstances, the effect of sulphate of ammonium on proofs which had not previously been fixed with hyposulphite of soda, and I always obtained the same result. Re-

peated after experiments convinced me that the action of sulphate of ammonia upon the image rendered its fixing with hyposulphite entirely useless, the sulphate of ammonia having the property of fixing at the same time it is acting, and that one may by this method produce directly, and by a single operation, brown or reddish toned pictures.

The sequel demonstrated to me that photographs fixed with the sulphate of ammonia then washed, resist, as well if not better, the action of the light, as those fixed with hyposulphite of soda, which when this operation is not performed with the greatest care, always lose something of their intensity after two or three years, especially when they have not been retouched. Proofs fixed with the sulphate of ammonia in 1847, have yet all the vigor.

I repeated the experiments which I have just described on proofs which had not been rendered sensitive to the light by means of the chloride of silver. I made the sulphate of ammonia to act, as well, upon a positive proof obtained by the process of M. Blanquart Evrard, which, having been produced by means of the chloride of silver, had preserved a brownish red shade, the hyposulphate of soda alloying with the nitrate of silver. Immediately after the immersion in the liquid sulphate of ammonia, the proof took a decided black tone; but this diminished an intensity immediately, and grew gradually pale; the outlines became insensibly contracted, and at last, in about ten minutes the image had vanished. This was repeated every time and as often as the paper upon which the image was fixed, became impregnated with the chloride of silver. I also can affirm that the employment of sulphate of ammonia as the fixative and as a means of obtaining a change in the color of the photographic images, is incompatible with the presence of chloride of silver.

Persuaded it will be of some interest to make known the exact process by the aid of which I obtained the best photographic proof, I will briefly describe it, hoping that those who have now time and facility will study in a more investigating way the action of the sulphate of ammonia, which, to my knowledge, has not been employed in Photography. (Note 1.)

A.—POSITIVE PROOF, BLACK BROWN TONE.

1st.—To spread upon the paper (2) a liquid compound in equal parts, of a cold and concentrated solution of gallic acid in distilled water, and a solution of four parts of nitrate of silver in sixteen of water.

2nd.—To dry with care the imbued paper between sheets of bibulous paper.

3rd.—To place the paper in the shield and expose to the action of the light from two to five minutes.

4th.—To bring out the picture with a solution of concentrated gallic acid, upon which the proof is allowed to rest, the impression side outwards.

5th.—To wash the proof with water, by means of injections; then also to let it rest for fifteen minutes in the water, and to repeat the wash carefully afterwards.

6th.—To plunge into the yellow sulphate of ammonia (3), (a portion of the concentrated preparation for twenty five parts of water,) until it has reached the right tone.

7th.—To complete, wash the proof, first, by passing through cold water; then by frequent injections by means of a syringe, (4).

8th.—Lastly, to completely dry it, first placing the proof in a blotting case, then in the open air.

B.—POSITIVE PROOF, FAWNISH OR REDDISH HUE.

To obtain a proof of this kind, proceed in the same manner as above pointed out, in number 6; after which, put into a porcelain basin, of a square form, sulphate of ammonia sufficient to cover the bottom, then cover the basin with a glass plate, to the underside of which adheres, and turned towards the liquid, the proof to be fixed, which on account of its damp state, adheres easily to the glass.

It is thus that the image is exposed to the fumes of the sulphate of ammonia, which is left to act for ten minutes; then the operations Nos. 7 and 8, above mentioned, are performed.

CH. BANCHAL.

Notes.

1. Sulphate of ammonia has been already employed by Precht for the changing of tones in the daguerreotype, that is to

say, in the obtaining of images on metallic plate. (*Dictionnaire de la photographie de Martins Vienna 1841.*)

2. Paper employed by me is that marked in trade Whatmann Turkey Mill.

3. The Sulphate of ammonia is obtained by saturating ordinary concentrated ammonia with sulphuretted hydrogen gas. The liquid thus obtained is preserved, in a paste state, in a flask hermetically sealed,

to which a little flour of sulphur is added.

4. Many photographers have the habit of leaving the proof in the water for twelve hours and sometimes longer to wash it; this habit is pernicious. It not only results from this a useless loss of time; but this thorough cleaning which is desired, is not completely effected, and the image loses its clearness by the swelling of the paper.

From the Journal of the Photographic Society.

ON THE INTRODUCTION OF MERCURIAL VAPOR INTO THE CAMERA IN DAGUERREOTYPING.

107 Regent Street, Oct. 5. 1853.



IR—As the communication "On a New Mode of conducting the daguerreotype process," by Mr. W. Crawford of Bombay, inserted in your last number, might induce many photographers to try the experiment of applying the mercurial vapor in the camera while the light is acting on the daguerreotype plate, I beg to submit to their consideration a few

remarks upon the plan, which is not by any means new, for I myself tried it as far back as twelve years ago. I took a patent in the year 1840 for the very same invention. At that time I considered it to be a great improvement in the Daguerreotype process, but after repeated experiments I had the disappointment of finding that the plan did not realize my expectations, and I abandoned it.

The bottom of my camera was supplied with an iron cup containing mercury, heated by a spirit-lamp to the required temperature, so that at the moment of placing the plate in the camera and opening the aperture of the lens, the plate was surrounded by mercurial vapor. The top and sides of the camera were of yellow glass, and through a tube placed on one of the sides, I could observe the development of the image; such were the principal features of my invention.

This idea originated at the time when iodine alone was employed, and when the accelerating property of bromine was not yet known; before I published through the Royal Society my discovery of the quickening effect of chloride of iodine and chloride of bromine, in the year 1841 (See Transactions of the Royal Society for 1841, and Philosophical Magazine, August 1841). With iodine alone, the taking of a view required half an hour, and a portrait several minutes. It was then desirable to have the means of ascertaining the progress of the operation during the exposure in the camera, in order to continue it until the effect was complete, and to stop it before the action was carried too far. This seemed to me practicable with a slow action of light, because the mercury had time to produce its effect, the two actions going on simultaneously.

I had the interior of the camera lighted by yellow glass in order to add to the developing property of mercury that of yellow rays which had been discovered by M. Ed. Becquerel. My plan consisted, therefore, in availing myself of the two modes of developing the image acting simultaneously, and it is exactly, as you see, the same which is proposed by Mr. Crawford as a new discovery, with the important difference that my plan, although impracticable, was founded on some correct principles of the art, while that of Mr. Crawford is inconsistent with the new dis-

coveries made in photography; for that gentleman does not seem aware that yellow rays which continue the action of light on plates prepared with iodine alone, destroy that action when the plates are prepared with iodine and bromine, which is Mr. Crawford's own preparation, as he states it in the beginning of his letter. Therefore his introduction of yellow rays in the camera, instead of adding to the action of mercury, would have the effect of neutralizing it altogether. These various properties of yellow rays will be better understood by reference to a paper on the subject which I communicated to the Royal Society, the 17th of June, 1847. (See Transactions for 1847, and Philosophical Magazine, Feb. 1848.)

The fact of yellow rays destroying the photogenic action imparted on the bromo-iodized plate, sets at rest the theory which was first expounded by M. Moser, a long time before, that yellow rays continued the action begun by white light on iodized plates, and from an idea that various bodies when in a state of vapor are evolving particular rays of light, supposed that the rays given out by the vapor of mercury were yellow. Hence he concluded that the developing action of mercury was due, not to any chemical affinity, but only to the continuing effect of the yellow rays evolved by its vapor. This theory would have been plausible had M. Moser been able to prove the fact of yellow rays being inherent to the vapor of mercury, because the developing action of yellow rays on an iodized plate acted on by light was a phenomenon founded upon undeniable experiments; and when Moser proposed this explanation, iodine alone was employed in the preparation of the daguerreotype plate. But some time after, bromine was introduced as an accelerating agent, and the old preparation with iodine completely abandoned by all daguerreotypists; it was then found that when bromine enters into the compound, the yellow rays, instead of continuing the action begun by light, destroy it altogether, and so much so, that the plate even recovers its former state of sensitiveness, as if it had never been exposed to light. This fact upsets entirely the theory of Moser, renovated by Mr. Crawford, that yellow rays are evolved by the vapor of mercury; for if that vapor had this singular property,

the photogenic action would be immediately destroyed by exposing the plate to the vapor of mercury, and no image could be brought out in the mercury box.

But, as Mr. Crawford observes, that *the use of a yellow medium requiring a strong light, for this reason cannot be of such general use as the other part of his process*, let us put aside the question of the developing action of a yellow medium, and examine how far the principal part bears the test of experiment and reasoning.

If we place a plate in the mercury box for a few seconds before submitting it to the action of light in the camera, the plate thereby gradually loses its sensitiveness, and if subsequently put in the camera, no image can be produced.

From this experiment it appears that the mercurial vapor, or the high temperature of the air contained in the mercury box, destroys the sensitiveness of the daguerreotype surface. But whichever of these two causes it is that destroys the sensitiveness the real fact is that if a plate is placed in a camera filled with mercurial vapor or hot air, the same impediment to their action of light must be the consequence. I cannot conceive how Mr. Crawford can have found that *pictures by these means were taken in a fraction of a second, giving a gain in time of say in the ratio of one to five seconds over the ordinary way*. He is evidently in error in his appreciation of the result.

Notwithstanding my previous strong conviction, I have just had the patience to repeat my old experiments, and actually try the plan re-invented by Mr. Crawford. The result has been what I had found twelve years ago. I have proceeded as follows: Operating at the same time with two cameras, supplied with a pair of lenses having the same focus and power, which I use every day in taking portraits for the stereoscope, and which in the same time produce pictures identical in their effect, I have invariably found that the picture taken in the camera containing the mercury was hardly beginning to appear, while the other was fully brought out in the separate mercury box. After that conclusive experiment, I tried another, in order to test whether the plate submitted to the action of mercury in the camera had lost its sensitiveness. I operated as before with the two cameras, and after having left during ten minutes

the plate in the camera containing mercury, I placed the two plates at the same moment in the mercury box, taking care to examine previously to what degree the image was brought out on the plate having received the simultaneous actions of light and mercury. After removing the two plates from the mercury box, I have found invariably that the one by the usual process was fully brought out, while the other was in the same state, no further effect of mercury having been added to the first; so that evidently it had lost its sensitiveness during the previous exposure to the vapor of mercury in the camera, while the other had received the full action of light.

I need not point out the inconvenience of having the camera filled by vapor of mercury, the object-glass obscured, by the same, and its brass tube amalgamated with mercury; or if, as recommended by Mr. Crawford, a glass were placed before the tube and the lens to protect them, the glass itself more or less covered by the condensed vapor, thereby obstructing the passage of the rays through it. I do not understand why Mr. Crawford recommends blue glass for this purpose. What has blue glass to do, when the object is to protect the lens from the vapor of mercury? Perhaps Mr.

Crawford imagines that the interposition of a blue glass would increase the action of light. If so, he is again strangely mistaken, for the photogenic action is stronger through a colorless glass than through a blue glass. The blue medium allows the photogenic rays to pass freely, but it does not produce them, or increase them when they are deficient. I had occasion to discuss this question in the *Journal of the Society of Arts* of the 18th February and 25th March, 1853.

In discussing, or rather opposing, Mr. Crawford's theories, I am only actuated by the wish of serving the art of Photography. I submit to photographers the results of my own experience in order to give them data in their researches, if they are inclined to try the plan. Those who have time, and the enthusiasm of their art, will do well to make some experiments; whether they succeed or not, they will gain experience, and perhaps arrive at some new facts upon the properties of light and mercury in the production of the daguerreotype image, which may be of the greatest importance; for as yet we know very little of the subject. I have the honor to be, Sir,

Your obedient Servant,

A. CLAUDET.

ON A PORTABLE DARK TENT.

SIR,—The dark tent I have constructed, and which I always use, consists of a flat board 2 feet square, and 3-4 of an inch thick, folding by hinges in the middle, to the under part of which a strong tripod stand is attached. A small iron rod 2 feet long rises from each corner, with pieces in the top to form a square frame; this is covered with thick (or yellow) calico, having an opening at the back to admit the operator, and fastened underneath the board. A hole of the requisite size allows the front of the lens to go through, which can be pointed at the object to be taken. This hole is made in a broad piece of leather, which slides up and down to allow for the elevation or depression of the camera.

A piece of yellow glass fixed just above

the camera admits light for working; and a conical tube of the proper size is attached to the front of the lens to cut off extraneous light.

To prevent the necessity of leaving the tent to take the cap off the front of the lens for every picture, I have contrived a flap to fit on the end of the lens inside the camera, which opens by drawing a string, and closes by a spring. It acts very quickly, and has the great advantage of giving the foreground more time.

This tent would also serve as a large camera by having the lens to fit into an upright fixed at the front, and a frame at the back to hold the paper or glass, and made to slide in a groove on the bottom board. In proof of this I have taken pictures by first getting the focus on a piece of ground glass, and replacing that with the collodi-

onized glass without using the dark frame. In this case pictures of almost any size could be taken; the glass or paper prepared on the spot, the picture taken, developed, and fixed without once leaving the dark house. This tent also packs up in a small compass, can be put together and taken apart in a very short time, is inexpensive and has room enough at the back, and on each side of the camera, for baths, trays, bottles and every other requisite.

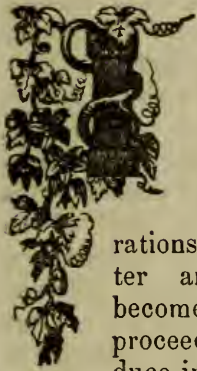
As I do all the washings in the tent, I use a gutta-percha tray having a hole at the bottom, and a tube to carry off the dirty water (a piece of sponge placed in the tube keeps out the light.)

If you should think this communication of any service to photographers, any questions you may find it necessary to ask will be gladly answered by, Yours respectfully,
HENRY BROWN.

Dublin, Sept. 12, 1853.

SELECTION OF PAPER FOR PHOTOGRAPHIC PURPOSES.

BY ROBERT HUNT.



It is natural to suppose, that a process which involves the most delicate chemical changes requires more than ordinary care in the selection of the substance upon which preparations of a photographic character are to be spread. This becomes the more evident as we proceed in our experiments to produce improved states of sensitiveness. As the material, whatever it may be, is rendered more susceptible of solar influence, the greater is the difficulty of producing perfectly uniform surfaces, and with paper this is more particularly experienced than with metal or glass plates. Paper is, however, so convenient and so economical, that it is of the first importance to overcome the difficulties which stand in the way of its use, as the tablet on which the photographic picture is to be delineated.

The principal difficulty we have to contend with in using paper, is the different rates of imbibition which we often meet in different parts of the same sheet, arising from trifling inequalities in its texture and unequal sizing. This is, to a certain extent, to be overcome by a very careful examination of each sheet by the light of a lamp or candle at night. By extending the paper between the light and the eye,

and slowly moving it up and down, and from left to right, the variations in its texture will be seen by the different quantities of light which permeate it; and it is always the safest course to reject every sheet in which any inequalities are detected. By day it is more difficult to do this than at night, owing to the interference of the reflected with the transmitted light. It will, however, often happen that paper which has been carefully selected by the above means will imbibe fluids very unequally. In all cases where the paper is to be soaked in saline solutions, we have another method of discovering those sources of annoyance. Having the solution in a broad shallow vessel, extend the paper, and gradually draw it over the surface of the fluid, taking care that it is wetted on one side only. A few trials will render this perfectly easy. As the fluid is absorbed, any irregularities are detected by the difference of appearance exhibited on the upper part, which will, over well-defined spaces, remain of a dull-white, whilst other portions will be shining with a reflective film of moisture. Where the importance of the use to which the paper is to be applied,—as, for instance, copying an elaborate piece of architecture with the camera, or for receiving the portrait of an individual, will repay a little extra attention, it is recommended that the paper be tried by this test with pure

water, and dried, before it is submitted to the salting operation. It will be sometimes found that the paper contains minute fibres of thread, arising from the mass of which it is formed not having been reduced to a perfect pulp. Such paper should be rejected, and so also should those kinds which are found to have many brown or black specks, as they materially interfere with some of the processes. Some specimens of paper have an artificial substance given to them by sulphate of lime (plaster of Paris,) but, as these are generally the cheaper kinds of demy, they are to be avoided by purchasing the better sorts. The plaster can be detected by fusing a sheet of the paper and examining the quantity of ash. Pure paper leaves less than $\frac{1}{2}$ per cent. of ash. If plaster is present the ash will be much more considerable: the increase of weight is however, sometimes due to kaolin. No really sensitive paper can be prepared when sulphate of lime is present; and it has the singular property of reversing the action of the hydriodic salts on the darkened chloride of silver, producing a negative in the place of a positive photograph. It is the custom for paper-makers to fix their names and the date on one leaf of the sheet of writing paper. It is wise to reject this leaf, or to select paper which is not so marked, as, in many of the photographic processes which will be described, these marks are brought out in most annoying distinctness. From the various kinds of size which the manufacturers use in their papers, it will be found that constantly varying effects will arise. A well-sized paper is by no means objectionable; on the contrary, organic combinations exalt the darkening property of the nitrate and muriate of silver. But unless we are careful always to use the same variety of paper for the same purpose, we shall be much perplexed by the constantly varying results which we shall obtain. No doubt, with the advancing importance of the art, the demand for paper for photographic purposes will increase; manufactures will then find it worth the necessary care to prepare paper agreeably to the directions of scientific men. Several of our paper makers are now paying much attention to the preparation of photographic paper, and are considerably improv-

ing it. I have been most obligingly furnished by Mr. Sandford, of Paternoster Row, with specimens of a great variety of Foreign and English papers, and from the care that gentleman is bestowing on this subject the most important advantages may be expected. All who desire to make any progress in photography must take the necessary precautions, or be content to meet with repeated failures.

The photographic peculiarities of paper mainly depend upon the sizes employed. The English paper manufactures very commonly employ gelatine, and this in very different conditions. The French, on the contrary, use starch, and this, from the strong affinity existing between starch iodine, appears to be one reason why the French paper is superior for the catotype in some of its forms.

Resin soap is used largely as a size. The soap is applied to the bibulous paper, and then decomposed by an acid water, leaving a fine film of resin spread upon the surface, susceptible of the highest polish.

The following tables will exhibit the results of an extensive series of experiments, which were undertaken after the publication of Sir J. Herschel's memoir "On the Chemical Action of the Rays of the Solar Spectrum," in which he has given a table of results, obtained with different preparations on various kinds of paper; but as he has not established the influence of the paper, except in a few instances, independent of the preparation, it became desirable to do so; and the result of several year's experience has proved the correctness of the conclusions then arrived at.

In pursuing this inquiry, it was found that the same description of paper, from different manufacturers, gave rise to widely different effects; so that the most carefully conducted experiments, several times repeated, have only given approximations to the truth. The form of experiment was to select a number of specimens of paper, prepare them with great care in precisely the same manner, and expose them to the solar influences. They were partly covered with a piece of colorless glass,—the object of this being to determine whether under it the action was quicker or slower than when exposed uncovered. Sir John

Herschel has shown that there are some peculiar differences in this respect ; and this method offered a very correct mode of determining the relative effects.

I.—*Papers prepared with Muriate of Soda and Nitrate of Silver.*

- a.* Superfine satin post..... Considerable exalting effect.
- b.* Thick wove post..... Depressing influence.
- c.* Superfine demy..... Slight exalting effect.
- d.* Bath drawing card..... Changes slowly.
- e.* Thick post..... Slight exalting effect.
- f.* Common bank post..... Ditto.
- g.* Thin post..... Very tardy.
- h.* Tissue paper..... Considerable exalting effect.

II.—*Papers prepared with Muriate of Barytes and Nitre of Silver.*

- a.* Superfine satin post..... Slight exalting influence.
- b.* Thick wove post..... Ditto, but stronger.
- c.* Superfine demy..... Similar to *a.*
- d.* Bath drawing card..... Similar to *a.*
- e.* Thick post..... Considerable exalting influence.
- f.* Common bank post..... Similar to *a.*
- g.* Thin post..... Similar to *e.*
- h.* Tissue paper..... Results uncertain.

III.—*Papers prepared with Muriate of Ammonia and Nitrate of Silver.*

- a.* Superfine satin post..... Strong exalting influence
- b.* Thick wove post..... Results uncertain—dependent on the size employed.
- c.* Superfine demy..... Slight exalting effect.
- d.* Bath drawing card..... Results uncertain.
- e.* Thick post..... Di to.
- f.* Common bank post..... Very slow.
- g.* Thin post..... Ditto.
- h.* Tissue paper..... Strong exalting influence.

IV.—*Papers prepared with Iodide or Bromide of Potassium and Nitrate of Silver.*

- a.* Superfine satin post..... Darkens slowly.
- b.* Thick wove post..... Results uncertain
- c.* Superfine demy..... Strong exalting influence.
- d.* Bath drawing card..... Very slowly changes.
- e.* Thick post..... Depressing influence.
- f.* Common bank post..... Slight exalting effect.
- g.* Thin post..... Ditto.
- h.* Tissue..... Results uncertain.

Unsize paper has been recommended by some, but in no instance have I found it to answer so well as paper which has been sized. The principal thing to be attended to in preparing sensitive sheets, is to prevent, as far as it is possible, the absorption of the solutions into the body of the paper,—

the materials should be retained as much as possible, upon the *very surface*. Therefore the superficial roughness of unsized sheets, and the depth of their imbibitions, are serious objections to their use. It must not however, be forgotten, that these objections apply in their force

only to the silver preparations; in some modifications of the processes, with the bichromate of potash, the common bibulous paper used for filtering liquids, has been found to remarkably well, on account of the facility with which it absorbs size or varnish.

Great annoyance often arises from the rapid discoloration of the more sensitive kinds of photographic drawing paper, independent of the nitrate of silver on the organic matters of the *size*. Unsized paper is less liable to the change. If we spread a pure chloride of silver over the paper, it may be kept for any length of time without any change of its whiteness taking place in the dark. Wash it over with a very weak solution of nitrate of silver, and, particularly if the paper is much sized, a very rapid change of color will take place, however carefully we may screen it from the light. From this it is evident that the organic matter of the size is the principal cause of the spontaneous darkening of photographic papers prepared with the salts of silver.

The most curious part of the whole matter is, that in many cases this change is carried on to such an extent that a revival of metallic silver takes place, to all appearance in opposition to the force of affinity. This is very difficult to deal with. Chemistry has not yet made us acquainted with any organic body which would separate either chlorine or nitric acid from their metallic combinations. I can only view it in this light:—the nitric acid liberates a quantity of carbonaceous matter, which, acting by a function peculiarly its own, will at certain temperatures effect the revival of gold and silver, as proved by Dr. Schafheutl's and Count Rumford's experiments.

Having been informed that the paper-makers are in the habit of bleaching their papers with sulphur and sulphites, I have submitted a considerable quantity of the browned papers to careful examination. In all cases where the paper has *blackened*, I have detected the presence of sulphur. Consequently, when the darkening goes on rapidly, and terminates in blackness, we may, I think, correctly attribute it to the formation of a sulphuret of silver.

It is, however, certain that the slow action of organic matter is sufficient, under certain circumstances, to set up a chemical change which, once started, pro-

gresses slowly, but certainly, until the compound is reduced to its most simple form.

China clay—*kaolin*—has of late years been much used by the paper manufacturers, for the double purpose of giving weight to the paper, and of enabling them to produce a smooth surface upon all the finer varieties of paper; such as the “enamelled satin post.” This compound of alumina and silica would not, if the finest varieties of clay were employed, be likely to do much mischief in the papers used for photography; but the less pure varieties of the Cornish clay are employed, and this commonly contains iron and other metals in a state of very fine division; and these, where they come to the surface, form little centres of action, from which dark circles spread in rather a curious manner. In France there has been manufactured a paper for this especial process; it is very thin, and of a tolerably uniform texture. It is said to answer exceedingly well with the modified forms of photographic manipulation employed in France, but it does not appear adapted, from some cause which is not clearly explained, to the English processes. Thin papers have been tried, and many varieties would answer exceedingly well, but that nearly every variety is found penetrated with small holes, which, though of minute dimensions, suffer light to pass freely, and consequently produce a spottiness on the resulting picture. Sir John Herschel found that this evil could be remedied by fastening two pieces of such paper together; but this method is troublesome and uncertain.

Returning to the consideration of *size* in the paper, the above-named authority—who employed the lead salts in some of his photograph processes—has the following remarks:—

“The paper with a basis of lead turns yellow by keeping in the dark, and the tint goes on gradually deepening to a dark brown. But what is very singular, this change is not equally rapid upon all kinds of paper,—a difference depending, no doubt, on the size employed; which, it may be observed here once for all, is of the utmost influence in all photographic processes. In one sort of paper (known by the name of *blue wave post*) it is instantaneous, taking place the moment the nitrate (if abundant) is applied. And yet

I find this paper to resist discoloration, by keeping, better than any other, when the mordant base is silver instead of lead. On the other hand, a paper of that kind *called demy*, rendered sensitive by a combination of lead and silver, was found to acquire, by long keeping, a lead or slate color, which increases to such a degree as might be supposed to render it useless. Yet, in this state, when it is impressed with a photographic image, the process of fixing with hyposulphite of soda destroys this color completely, leaving the ground as white as when first prepared. This fortunate restoration, however, does not take place when the paper has been *browned* as above described. Some of the muriatic salts also are more apt to induce this discoloration than others, especially those with the earthly bases."

It will be evident from these remarks that it is of the utmost importance to secure a paper which shall be as chemically pure as possible. Experience has proved that recently-manufactured paper does not answer equally well with that which has been made an unfounded statement, but it is not so; and the causes operating to the improvement of paper by age are evident. The organic matter of the size is liable to a spontaneous change; this goes on for a considerable time, but at length the process becomes so exceedingly slow that it may, for all practical purposes, be said virtually

to rest. Paper changes its color by keeping from this cause, and I have found that such as I have selected from the shop-worn stocks of stationers has been generally superior to that which has been more recently manufactured.

Select, therefore, paper of a uniform texture, free from spots, and of equal transparency, choosing the oldest rather than the newest varieties.

Where the process is highly sensitive for which the paper desired, it is important to treat it in the following manner:—Having a shallow dish sufficiently large to receive the sheets of paper without in any way crumpling them, it is to be filled with very clear filtered water, to which a sufficient quantity of nitric acid has been added to make it slightly sour to the taste. Taking a sheet of paper, it should be laid on a porcelain slab, and sponged with clean water on both sides, after which it should be placed in the acidulated water, and allowed to remain in it for several hours. Too many sheets should not be placed in the vessel at the same time. After a time they should be removed in-mass, placed on the slab, and left for half an hour under gently flowing water,—this removes all the acid, and all those metallic and earthly matters which it has removed from the paper. After this it is to be dried, and it is then fit for photographic use.

TO THE EDITOR OF THE JOURNAL OF THE
PHOTOGRAPHIC SOCIETY.

SIR,—I have found the following simple expedient give such excellent results in iodizing paper, that I think it will prove acceptable to some of your readers.

I float the paper upon distilled or clean rain water and allow it to remain until it has imbibed all it can. It is then damp at the back and perfectly flat. I then pin it up by two corners, and when quite dry, let it imbibe as much as it will of the iodizing solution.

The resulting film is very strong and even. It appears to me that the water

opens the texture of the paper and ensures complete and regular imbibition in the subsequent operation, answering much the same purpose as Mr. Stewart's use of the air-pump.

When the single-wash iodizing solution is used, it is better to immerse the paper in water *before* the solution has quite dried, or a crystalization takes place which renders the film of iodide of silver rather irregular upon the surface, where the greatest equality is required.

I am, Sir,

Your obedient Servant,
MORRIS F. DAVEY.

From the London Art Journal.

THE ITALIAN LAKES.



WHILE descending the beautiful shores of the Italian lakes, one of the first surprises which must take possession of the mind of any moderately enthusiastic artist is, that such scenery should have aroused no talent among its inhabitants equal to the task of its representation; that all should be left to foreigners; and certainly it is very remarkable that the Italian nation has produced so few landscape-painters of any consideration, while the most distinguished in other countries have achieved their noblest triumphs by painting Italian scenery.

To celebrate the *actions* of illustrious men by pictorial representation is obviously a higher aim, and one more worthy the exercise of great talent, than merely giving the *scenery* in which those actions took place. But the admirers of inanimate nature are numerous, possess great intellectual attainments, and are quite equal to the most perfect enjoyment of every faithful delineation of those scenes in which they are accustomed to seek health and recreation; and now that Italy has asserted her superiority over all other countries in recording the highest class of incidents which ever happened on earth, and that the lapse of centuries has produced, not only no rival, but no imitator who could for a moment contend with her, might not her sons, who seem equally unable with foreigners to tread in the footsteps of their ancestors, turn their attention to a new branch of the art, and while administering to these of a considerable circle of admirers, forget their political distresses in the hitherto unstudied beauties of the scenery which surrounds them?

A notion prevails in England that the art of landscape-painting is so easily acquired, as to be unworthy the attention of men of a high range of intellect; if we consider that of the thousands of our countrymen who annually cross the Alps, an enormous proportion are armed with a sketch-book, we might fairly conclude that the art

is easily attained and that we are a nation of landscape-painters—perhaps we might be undeceived if we inspected the books on their return, we certainly are when we examine the catalogue of the Royal Academy and count the names of those whose position is unquestionable as figure-painters and then observe how much smaller a number among landscape painters we should be disposed to place in the same rank. The reviewers in periodical publications, are all ready to declare an exhibition ‘inferior,’ when the landscapes predominate, but if those landscapes were of the highest class, or were even efforts beyond the merely pastoral, I doubt if this would be so. All writers upon the Italian masters are ready to speak in high praise of their landscapes,* though they were for the most part merely accessories to the figure-subject in the foreground; with them this result is attributable rather to their exquisite sense of form and color, than the motives that actuates ourselves, which are more readily traced to a thorough love of out-of-door life, than any particular appreciation of artistic excellence in its representation. The question as regards the ancients also, has been well considered by Mr. Howitt,† and their indifference to landscape-painting is by him assigned to their habits and tastes not leading them, as ours do, into that close intimacy with inanimate nature, which results in its description by both poets and painters. Mr.

* The landscape portion, to Titian’s “Death of Peter Martyr,” is a particular instance of this desire to add another leaf to their laurels. Burnet, in his “Letters on Landscape-painting,” gives an etching of these trees, page 32. Turner is said to have bestowed his praise upon the foliage (Pre-Raphaelism, 46), and many other writers have equally borne testimony to this unusual instance of landscape in an historical subject. The landscape portion of the “Presentation of the Virgin in the Temple” is remarkable for the richness of the coloring, and perhaps shows more emphatically how Titian would have painted an entire landscape than the other more frequently quoted example. Both are now, I believe, in the Academy at Venice, the “Peter Martyr” having been moved from the church for which it was painted, since I saw it.

† “The Rural Life of England,” Vol. ii.

Twining* considers that they had no landscape-painter at all, "nor any word in the Greek or Roman language appropriated to express exactly what we mean by a *prospect*." This last remark is certainly not applicable to the modern Italians, for wherever we go we find proofs of their sensibility to the general beauty of their lovely country. We need only recall the epithets applied to some of their cities, as "Genova la Superba," "Bella Napoli," or the proverb "Vede Napoli e poi mori;" or the names of their houses. "Bell'osguardo," "Bellavista," "Bellevedere," &c.; a common peasant in the south of Sicily, at Chiaromonte, observing my admiration of the prospect from the town, told me it was called "Il Balcone di Sicilia;" and in various ways we are prevented bringing such an accusation against them. Still in the interminable catalogue of the Italian masters, almost every landscape-painter of repute is a foreigner with an Italian soubriquet, as "Tempeste" for Muller, born at Haarlem; "Orizzonte" for Van Bloemen; "Enrico di Spagna," for Heinrich Vroom, who had merely made a journey to Spain. Gaspar Vanvitel, of Utrecht, was Italianised into "Vanvitelli," and the Flemish brothers, Mathew and Paul Brill, become "gli Brilli." Yet whatever the Italians and these men did learn of landscape was from Titian, for before his time, as Lanzi says, they knew as little how to paint a landscape to their figure, as Phidias is said to have done of a throne for his god, when he had completed the figure.† Annibal Carracci gleaned his knowledge from Titian and Paul Brill, thus laying the foundation for Poussin and Claude Lorraine.‡ We find two landscapes also by Domenichino in the Doria Palace at Rome; and Leonardo da Vinci, who studied everything, is said to have given his attention to landscape-painting, and imparted his knowledge to Gaspar Poussin, and so on. But when we go to see an

Italian collection of pictures we find the room of landscapes filled with the works of such men as N. or G. Poussin, Vander Werf, Orizzonte, Paul Brill, Breughel and Berghem—this is in the Colonna palace at Rome; in the Doria palace we find large fresco, or tempera paintings by Gaspar Poussin (Dughet) with some of his best easel pictures; also pictures by Paul Brill, Both, Vanvitel, and Claude (his two most celebrated works); there are certainly some by Salvator Rosa, a veritable Italian landscape painter, but even his reputation depends far more on his figure-painting.§ In the Borghese collection it is the same, and indeed it is so with some other collections. We must therefore conclude either that they wholly disregarded that particular branch of their vocation, or, that from some peculiar mental organisation they were unable to attain any excellence in it. Nor are matters improving in the present age; and what is worse is that a notion prevails both in Rome and Naples, that foreign artists degenerate after a lengthened residence there, which is wholly contrary to the experience of the fifteen and sixteenth century. It is happily far otherwise with those of our own countrymen, who merely visit foreign lands and bring home studies for pictures to be painted on their return; and I believe a painter of perfectly English scenes, would find his powers of observation, even of them, much increased by summer and autumn devoted to the study of Italian landscape. And nowhere could he so readily find every variety of subject in an easy ramble as by a visit to the Italian lakes. They differ materially from the Swiss in almost every essential; they command equally fine views of the Alpine scenery, while the lower range of mountains is clothed with vegetation. They have, too, in some instances at least, that great charm of lake scenery, islands, floating as it were, idly

"As a painted ship upon a painted ocean;"

* "The Philosophy of Painting" pp. 60, 61, quoting however from an edition of Aristotle by his relative.

† Vol. ii. p. 227, Roscoe's translation. It is remarkable that Lanzi gives the name of but one Venetian who painted landscape as the *subject* of his picture, and he was probably an amateur, "a literary friend of Titian's Geo. Maria Verdizzotti."

‡ Kugler's Handbook, by Sir C. Eastlake, 484.

§ At the end of each epoch in the various schools of painting Lanzi gives the name of several artists who were known as landscape, or marine, or architectural painters—known as *quadristi*; some merely decorating the walls in fresco or tempera, while others occasionally produced easel pictures. But scarcely one of these is known on this side the Alps: Pannini and Canaletto readily recur to the memory, but there we hesitate.

and, more than all, every miniature bay or creek has its village and little fleet of rustic boats; every town or cluster of houses has a fort, or tower, or dome; and the interval between one town and another, is happily broken by villas of all proportions, while beautiful promontories, or headlands, crowned with the cypress, or pine, thrust themselves forward into the purple waters, which they dye with the reflection of their own varied hue.

The town of Como will probably be the first place in which most travelers become acquainted with the interior of the highly-decorated Italian church, made up of materials and designs of various ages and styles, containing many paintings, some really good, others merely curious. The altarpieces by Luini, a native of Luino, on the shores of the Lago Maggiore, whence his name, is considered a very fine work. There are also two distemper pictures on canvas by him, which are mentioned in Kugler's hand-book, by C. Procaccini, and numerous other objects of interest.* The Broletto, or town-hall, will introduce him to buildings constructed of different-colored marbles in layers, of which he will find plenty afterwards at Genoa and Pisa, and there is a good gateway to the little piazzas, erected in honor (?) of a visit from Francis I. The views of the town from the lake itself are not so good, as the walls of the little harbor shut out many of the best features. By ascending the hills on either side, you see over these;—there is a very pretty walk leading from the road to Lecco, by the Villa Pasta, to Pliniana, which commands fine views of the town and hills, with the tower of the Baradello behind it. The drive to Lecco by Erba is very beautiful; but the Lecco branch of the lake does not furnish such good points for drawing till you get to Varenna, where you have both reaches and the promontory of Bellagio before you. The mountains behind Lecco, however, have fine forms.

Beautiful as the Lake of Como undoubtedly is, many prefer the scenery at the head of the Lago Maggiore, myself being of the number. Nothing can exceed the beauty of the views from the hills behind Baveno; the mountains take every form you can possibly desire, from the isolated Monte Laveno, to the long chain of snowy

Alps stretching far away to the north and east. To one who had never seen the islands in paintings, I could imagine they would convey a notion of enchantment; but long familiarity with the appearance of the "Isola Bella," materially disturbs our enjoyment of it when actually there. I strongly advise any one of an over-critical disposition not to land there, but to walk into the chesnut-woods behind Baveno, and look at it through the trees; he may become poetical in spite of prejudice. Murray has amusingly collected the different opinions of Simond, Matthews, Saussure and Brockedon on the merits of this beautiful "folly."—*Handbook to Switzerland* p, 183.

From Baveno, is a very celebrated walk over the Monterone to the Lake of Orta, commanding a superb view of the Alps, and having a fine descent upon the lake, with the pretty island of St. Giulio lying under the opposite hills. For the lower part of Lago Maggiore, Arona is the best resting place. The whole of this part of Italy is so intersected with beautiful routes, it would become tedious to enumerate them—one can scarcely go wrong; but for views of Monte Rosa, from the valleys immediately adjacent, it will be necessary to leave the Lake of Orta for Varallo.

Varese and its lakes I think very disappointing, and except some of the chapels on the Monte Sacro, I drew nothing there. The view from the hill is exceedingly grand, and I saw it first under most favorable "skyey influences," when I could see over the plain of Lombardy to the Maritime Alps. It is, however, a view for a panorama, and scarcely even that, and the lakes are in the plain. Lugano is beautiful, with more of the aspect of a Swiss lake about it; there is good forest scenery in the pass to it from Magadino, on the Lago Maggiore; and the chief point of beauty upon it is passed in the passage from Lugano to Porlezza, on your way to Cadenabbia, on the Lake of Como.

To visit the remaining lakes of Iseo, Idro, and Garda, would materially extend the tour: they have, however, many points of great attraction. Lovere, at the head of the Lago Iseo, is beautifully situated, and the view up the Val Camonica towards the Stelvio, is singularly fine; a very similar view by the riva of the lake of

* Sir C. Eastlake's Edition, page 290.

Garda is destroyed by a mountain having, some time or other, rolled over and broken in three pieces, which chokes up the entrance of the valley.* A stream bursts from the heart of the mountain behind Lovere through an opening large enough to admit a boat, and giving one or two fine falls in its course, turning several mills, joins the lake at the town of Bisogne. The little town of Predora stands delightfully at the bend of the lake towards Sarnico; it appears so out of the world and reach of contamination, I was dreadfully shocked to hear that out of a small population of 200, exactly 150 perished by cholera in 1836-37; Lovere escaped altogether. The island, Monte Isola, is too large for the lake; you lose all notion of its being an island: there is a smaller one, St. Paolo, the site of a convent, now occupied by a silk grower's establishment, but it has no particular recommendation. Other small villages are dotted about this part of the lake; the small town of Iseo, whence the lake derives its name, possesses no very striking features either, but here small carriages may be procured to carry you to Brescia.

From Brescia I went to Salo on the Lake of Garda by way of reaching Vestone, the best resting place for the Lake of Idro. The drive through the Val Sabbia is very fine; richly wooded hills, studded with castles, rise out of groves of walnut, of majestic growth. The village of Nozza is remarkable for the verdant scenery which surrounds it, while the river Chiese flows from the lake a full rich stream; an hour and a half's drive on its banks brings you to Vestone, where are to be found decent lodgings for a Rambler. The walk hence to the lake takes you across a ravine where the Chiese comes foaming down a slope in the most brilliant manner, leaving the lake behind as calm and undisturbed as a mirror. The mountains appear to fall into it in rude and craggy masses, but still covered with verdure. On the left, one is surmounted by the fortress called Rocca d'Anfo, and about this are the finest points of the lake; I found when too late that there is a good cross road for pedestrians from Lovere

on the Lago d'Iseo to Vestone, near the Lago d'Iseo which will save much hot and dusty traveling in country carriages.*

The Lake of Garda is the high road from this part of Lombardy to the Tyrol, and by this time I presume there are daily steamers up and down: it was not so when I was there. A steamer passed up one day and down the next, and a boat with paddle wheels—worked by six horses on deck, their task-master perched on a chair in the midst of them—supplied the service on the alternate days.—Rough country boats are procurable at many points, and all have remarkable sterns and rudders, looking as if they were “stove in” On Como, there are many elegancies about the boats; the awnings are generally good and of different colors, the bows have some of the characteristics of Venetian boats, and the sails are of often decorated with painted garlands or Madonnas. The stormy character of the Garda and the more warlike aspect of its buildings, put these frivolities out of countenance. The color of the waters of the Garda is quite different to that of the other lakes, it resembles more the color of the Bay of Naples—an intense French blue. Seen through the fortress at Peschiera, one is reminded of poor Muller's picture of the brass gun at Smyrna, with “the dark waters of the deep blue sea” glistening through the embrasure. Sirmione at the S. E., Malcesina nearer the head of the lake, and then Ponale and Riva, are the great points of attraction. The view of the valley beyond Riva, reaching to the Tyrolean Alps, is much impeded by the fall of a mountain ages ago; on the summit of a portion of this is built the fortress of Arco, whence there is a very grand view.

By the time we have arrived at the Lake of Garda we have become familiar with the beautiful gray cattle of Italy, which do the work of horses, fastened by various expedients to waggons and carts of all sorts. In the finer breeds we are charmed by their large gazelle-like and silken lashes, and the delicately formed nose and lip: more tow-

* Kugler mentions, “Handbook of Painting,” edited by Sir C. Eastlake, pg. 220, that even here there has been an Art-Institution established by Count Tadini.

* It may be well to say of these lakes—Iseo and Idro—that beautiful as they are, they are more properly objects of interest to the Rambler than the artist: they are deficient in incident.

ards Central Italy we meet with richer colors in the darker portions of their skin, the jetty black stripe on the forehead, and the dark hue of the shoulders often being tinged with a rich tan color, but the prevailing color consists of shade of grey.

From the Journal of the Photographic Society.

ON THE EMPLOYMENT OF ALBUMENIZED LACTATE OF SILVER.



SHORT time ago some indications were given in *La Lumiere*, respecting a process invented and practiced by M. Come de Cosio, which was announced as giving the layer of collodion a solidity equal to that of albumen. In the note in question nothing was said about the employment of albumen; however, this substance was included in the silver bath.

Having had occasion to see M. Come de Cosio before his departure for Mexico, he showed me some positive impressions obtained by this process; these impressions really possessed perfect solidity, rendering the employment of varnish superfluous, and the author told me that he had discovered this process through researches with the object of combining albumen with collodion.

The soluble salts of silver are very few; the nitrate, coagulating albumen, could not be used in this case; lactate of silver, on the contrary, is very soluble and does not coagulate albumen.

M. Come de Cosio seemed desirous of giving more complete publicity to his process; I had no opportunity of seeing him again, but I formed the design of studying his process in order to communicate it to our readers.

At first I found great difficulty in procuring lactic acid; it is an unusual product only to be obtained of good quality by paying a high price; the specimens which I tried several times over, were insipid to the taste and scarcely affected oxide or carbonate of silver. At length M. Balard, to whom I mentioned this cir-

cumstance, offered me lactic acid prepared in his laboratory at the College de France. I hastened to accept his offer, and from that time was able to succeed in the practice of M. Come de Cosio's process.

Having placed an excess of oxide of silver in a flask, I added the lactic acid; the action of the latter was immediately indicated by a slight effervescence and the aggregation of the oxide of silver; by heating with a lamp and destroying the cohesion of the oxide with a glass rod, the effervescence, very lively at first, diminished by degrees, and the yellow color of the liquid became rather greenish; cooled slowly, it solidified; this was lactate of silver. On adding twice the volume of water and heating again, the lactate was entirely dissolved; I filtered it immediately, but in spite of this it deposited a great quantity of crystals in cooling, and I was obliged to add more water to complete the solution.—The liquid was now clear, and of a greenish tint, doubtless from the presence of a little copper.

I then mixed it with a fourth of its volume of fresh albumen, and introduced the whole into a funnel loosely stopped with a plug of wet cotton. A certain portion of the albumen was coagulated, but a liquid passed through the filter slightly opalescent and frothing when shaken, which was certainly a mixture of fluid albumen with lactate of silver.

It was then a point of interest to know whether lactate of silver, with or without albumen, was more photogenic than nitrate of silver. Placed on paper in both states the coloring was very distinctly marked, and much more quickly, under the action of light; but the developing agents, such

as sulphate of iron, gallic and pyrogallie acids, did not blacken it so much, as they had nitrate of silver exposed to the same amount of luminous action.

A plate of glass covered with collodion prepared with bromide of zinc, which gave a most intense black with an action of diffused light for five seconds, after being subjected to the sulphate of iron, only assumed a deep brown (*bistre*) tint under the same circumstances with albumenized lactate of silver. I concluded that the difference would be quite as marked in the camera; but the sensibility proved pretty nearly equal with the bath of nitrate and the bath of albumenized lactate. With pyrogallie acid the advantage was on the side of the ordinary nitrate bath, especially in regard to clearness of definition.

With collodion prepared with iodide of ammonium the result was the same; therefore we must not count on very great sensibility with lactate of silver.

With regard to the cohesion of the layer of collodion, the essential point to be settled, my expectations were not disappointed; I was able to glue the impressions on waxed cloth and on paper with great ease. After being dried in the open air, the pellicle was so solid that the nail glided over it rather than disturb it; impressions could be detached from the glass in order to fix them to waxed cloth the reverse way, that is, so as to give a reversed image. The cohesion of this collodion is also readily appreciated by the effort necessary to tear it; however, this cohesion does not attain

to the point of allowing a floating impression to be taken up by two corners and laid upon a glass without being torn in two; it is the drying that gives it the extreme toughness.

This increase of cohesion will certainly be very decided with certain collodions, I will venture to say with most of the collodions now used; their brittleness depends on the large proportion of alcohol employed in the preparation of photogenic collodion. This proportion sometimes rises to half the volume of the æther employed.—It is true that the alcohol causes the collodion to adhere to the glass, but it destroys its toughness; the employment of concentrated hyposulphite of soda disaggregates the collodion equally rapidly.—To prepare a collodion which will be solid, and to preserve this important quality in it, *the gun cotton must be digested in rectified æther, and alcohol only added in small quantities, just sufficient to attack the gun-cotton.* If the gun-cotton is of proper nature, the collodion will be formed without any addition of alcohol; it will give extremely tough pellicles, which will immediately imbibe nitrate of silver without forming oily lines.

Consequently it is bad to prescribe beforehand the quantity of alcohol to be used in the preparation of collodion; the least possible quantity should be used, and no more added after the shaken liquid froths a little, and when left to rest for a few seconds leaves a ring of floating bubbles, which do not quickly burst.

GENERAL REMARKS UPON COLLODION.

Translated from the French of La Lumiere by Miss E. P. Peabody.



ADMIRAL Lugeol, who is a distinguished Amateur of photography and whom we do ourselves the honor to count among our subscribers, writes us from Toulon for some general instruction upon the subject of collodion; he says the collodion of Bertsch does not succeed in that country, and that the collodion which he has prepared himself, although it was very rapid, is always disposed in streaks which have spoiled the proofs, notwithstanding he had varied the proportions of alcohol, of ether, of iodide of ammonia, and of neutral collodion; all these difficulties have disgusted him with the process and he thinks that a special article on the subject might help to remedy the evil.

I am very sorry that M. Lugeol has not indicated the defect which he has found in the collodion of Bertsch; for M. Heilman operated constantly in the South with the greatest success, using this same collodion. I have seen from him a proof upon paper of half-size, in which persons passing in the street are very well rendered; the body is complete; the leg only which was in movement forward is a little confused. Consequently the negative will be obtained by an exposure which ought not to exceed a quarter of a second. M. Heilman it is true, knows perfectly how to manage this collodion, he has not used any other, and he consumes I know not how many flasks per week.

Nevertheless even he has had his days of failure in changing localities. At the Eaux-Bonnes he has been many days without power to obtain anything; his plates being always disarmed, which he has attributed with reason I believe, to the permanent sulphurous emanation in this place. They acted as a too energetic accelerator which reduced the silver without the aid of the light. In order to succeed it has been necessary for him to moderate the susceptibility of the collodion.

I presume that it is a difficulty of this kind which is in the way of M. Lugeol; these grey mists are very common to susceptible collodion; M. Delahaye has given to me a very ingenious theory for it which merits consideration; this is his argument.

"The most susceptible collodion ought to be carefully sheltered from any diffuse light and from every deoxydising emanation otherwise, the silver is partially reduced upon the surface of the plate, where it forms a *metallic bed invisible, but effective, which from its nature is opaque and forms a scum*. The impressibility by light is entirely different; those composed of silver are modified by little atoms, but there is not any silver formed, the scum does not exist; the light acts freely, and the agents successively reduce the silver every where, where the light has penetrated. In the first case on the contrary, the light has not passed anywhere, it does not come from the image; the successive liquids detach an infinitely thin metallic skin, and their action limit themselves to reduce, at length the nitrate of silver which deposits in its turn a grey film over the whole plate."

I do not hold the opinion that the diffused light can of itself produce this effect, for it does not reduce more silver than the light in the dark-chamber; it only modifies the sensible film by reason of its intensity. It would be apt to veil the shades of the positive proofs or the lights of the negative proofs, but without however depreciating its value; I have also observed that the diffused light which permits operating without a candle, and the moderate light of a candle are entirely inappreciable upon *positive proofs, the most delicate*, obtained with the collodion of Bertsch. Thus, we must not confound the two entirely different effects; the diffuse light counts only for its value but the reduction effected anterior to the luminous radiation presents an obstacle almost insurmountable to this radiation.

The quick collodions fail also for another reason which arises from their reductive power upon the bath of silver, combined

with the continuing agent. With a bath of silver rigorously neutral, it happens that the sulphate of iron or of pyro-gallic acid will reduce the insoluble silver independent of the light; in this case we shall have an image covered by a general grey tint. For to prevent this *a peculiar sulphate of iron*, is *necessary*, that is to say, not too reduced; above all to add some acetic acid to the bath of silver in order that the negatives may be developed by the pyro-gallic acid; and some nitric acid, that the positives may be developed by the sulphate of iron. *With a bath of silver acidulated by the nitric acid, all the baths of sulphate of iron are good.*

I have found however a means much more simple which, at the same time prevents the reductions previous to the exposure, and dispenses with any addition of the nitric acid in the bath of silver; it consists in adding to the collodion every time that it produces proofs dimmed by excess of susceptibility, some drops of the tincture of iodine prepared with rectified alcohol; all which is very simple: this precaution introduces into the collodion free iodine which in contact with the nitrate of silver, produces iodide of silver in separation from oxygen which disengages itself, and nitric acid which adds itself to the bath; it is as if one had put this acid in collodion or in the nitrate of silver. This process has the great advantage of giving stability to the collodion, and of making the same bath serve for the positive or negative proofs.

For the same reason, this tincture of iodine, added in very small quantities to the collodions with bromide bases, which are the most susceptible, gives vigor to the proofs obtained with these collodions, which have always a certain tendency to dimness; and as the iodine thus added evaporates very quickly, if one wishes to moderate the action, it is easy to retard the application by some collodion upon the bath of silver.

As these are rapid collodions, so also there are slow collodions which are not the least numerous. They are recognised by their red color which indicates precisely the excess of free iodine, of which we have just spoken. The means for making these active are precisely the reverse; it is ne-

cessary to employ neutral baths of silver and to have recourse to reductive substances.

The reductive substances are very numerous, but the greater part are so energetic that it will be necessary to use them in very small proportions; these are the concentrated ammonia, tannin, gallic and pyro-gallic acids, the essential oils, phosphorus, &c.

The liquid ammonia is the best energetic substance and consequently the most easily used; it acts in neutralising the acid. The best way for using this is to add it drop by drop to the bath of silver. Among the other substances I have yet only studied the gallic acid. To add then to the collodion and to facilitate their operation it will be necessary to dissolve them in alcohol or ether in the ratio of one part to a thousandth of the dissolvent.

In order to give an idea of the accelerating power of these reductive agents I will only cite two well characterised facts which I have proved.

In comparing the susceptibility of a chloride of collodion, I was able to establish, by means of diaphragms very dissimilar, that the chloride of collodion was three hundred times slower than the ordinary collodion; in a word to do this a diaphragm was necessary presenting a surface with an opening three hundred times greater for operating as quickly: but some drops of alcohol, holding a millimetre of its weight of gallic acid immediately procured a normal susceptibility. Flakes of gallic acid, large as the head of a pin were introduced into a flask of 100 grammes of collodion of Le Gray, which was red and very slow, caused the plates to become entirely dim immediately after having poured on the pyro-gallic acid.

The collodion of Bertsch develops aldehyde almost always, like the greater number of the bromides of collodion this body develops of itself during the preparation of the collodion, in certain conditions.

By what I have said, I think I have indicated the means of diminishing and increasing the susceptibility of the collodions, and of producing by these means the best proofs in all circumstances; but it is necessary also to consider an ingredient equally variable with the localities, which can set at nought all

the other precautions we may have taken; I would speak of the water used in preparing the baths and solutions, for the development of the images. River and spring water is generally good: distilled is always preferable *but it is necessary to avoid with the greatest care the use of that which comes from the condensation of vapor by machines*; it contains a reductive principle which it has acquired by its contact with the oil of the pistons, a principle which browns immediately the nitrate of silver and the pyro-gallic acid; the sulphate of iron, itself prepared with this water constantly dims the proofs. It is sold at Paris, and it is from having wished, against my constant habit; to employ some distilled water, believing it to do better, that I have proved the failure that comes from it. Rain water is of the same nature; being nearly always charged with an organic matter, which prevents success with the rapid collodion.

It remains to me to treat of the means suited to give to the collodion a fine even surface, except, as far as possible from streaks.

To attain this end, it must be remarked in the first place, that it is the rapidity of the volatilization of the dissolvent which causes the deposition of the collodion in streaks; consequently, this inconvenience will be more marked in warm and dry than in temperate and moist countries. The best means of remedying this, is to increase the proportions of alcohol, diminishing that of ether; but at the same time it is necessary to avoid with the greatest care employing alcohol at 36° , which is aqueous, and of itself causes the deposition of collodion in streaks of another kind, forming slight festoons without connexion; these especially are the streaks which injure the proofs. Thus in warm and dry countries it is necessary to employ as much alcohol well rectified at 40° , as of ether, also rectified, in order to form an adherent collodion serving to produce negatives

In order to transfer these proofs upon

waxed paper, the adherence of the collodion must be diminished at will, by augmenting largely the proportion of thick pharmaceutic collodion.

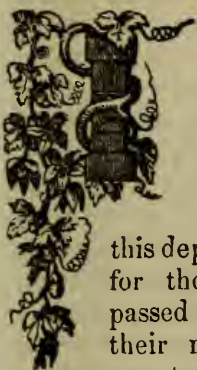
As to the proportion of iodide or of bromide to be introduced it is limited by the cohesion to be given to the collodion; it varies from fifteen to forty-six grains for a pint of collodion. I find that thirty grains suffice in all cases. The collodions strongly charged with iodide or bromide are liable to be detached, it is said; the expression is not true however; for it is not the collodion which is detached but rather the iodide or bromide of silver which covers its surface and forms the susceptible skin. The disintegration of the sensible skin may also happen in three ways, which are: 1st, when the bath of silver is too feeble; 2d, when it contains too much of foreign salts, and alone all of ammonia salts; 3rd, when the collodion contains a humid principle proceeding either from aqua-ferrous ingredients which have entered into the composition or from water developed by the change of its constituent principles. It is very rare that the old collodions are free from this fault—which may be remedied sufficiently by re-enforcing them with a medicinal collodion of good quality.

In a word, in order to use with success a flask of any collodion whatever, it is necessary to act with reference to all the ingredients, the locality of operation, and the contents of the flask: it is exactly the same as with navigation, which in order to be successful the Captain must take into account not only the direction of the wind, but also the state of the sea, and of the currents, of the force of the wind, and the qualities of the ship, &c. If with a fine ship and a very strong breeze he should, in order to sail very quickly put out all the sails he risks dismasting or an upset; he can only make a safe voyage by taking into consideration all the circumstances; it is thus with the successful use of a flask of collodion.

M. A. GUADIN.

From the Manchester Examiner.

CARDINAL WISEMAN'S LECTURE ON THE CONNECTION BETWEEN THE ARTS OF PRODUCTION AND THE ARTS OF DESIGN.*



WILL now speak of a department of art which will interest you, perhaps, more than others—art applied to textile fabrics. There is a great difference between what art can do in this department and what it can do for those through which I have passed; because the others are in their nature more lasting; they are to continue for a time; they are worth, therefore, the attention and care of artists of the very highest class. The fashions of textile fabrics are perishable and fragile—they are capricious and changeable; therefore it is impossible to have the time, the leisure, and the same degree of labor expended on them as is necessary to produce a great work of art. I have read with considerable pleasure and can bear testimony to, the important suggestions in a pamphlet or lecture on this subject delivered in this city by Mr. Potter. (Cheers.) He is quite correct in his estimate of the somewhat exaggerated ideas which may exist of the power of art in connection with that which is not durable, and which in reality has its value, necessarily, for only a brief period. I agree, therefore, with him on that subject; but at the same time I accept as very important his concession that, even with regard to that degree of art which is compatible with the nature of the substance on which it is to be displayed, we do *not* do what we ought to do, and that we fall short of our neighbours—or at least that, while in that which is of secondary character we have put forth such perseverance and study as to have attained an equality with them, there is a point, in that which is more delicate and perfect, which we have not reached. (Cheers.) This is an important concession. It appears there is some reason why, in France, they can produce, even in printed fabrics, a superior and

more delicate, more beautiful artistic effect, than can as yet be given here; and I shall have to speak of the reason of this, which accords completely with what I have said, because in these works, which are not made absolutely by handicraft, but with the assistance of mechanical skill, there *must* be a distinction between the designer and the mere workman—a man who keeps the machine in motion and puts the work through it, although, no doubt, it is necessary for the designer also to have a considerable acquaintance with the process by which his design is to be brought out in actual manufacture. I only wish to observe how the principle comes down here. You know the cartoons at Hampton Court, the most perfect and finished work of art of Raffaele. You would suppose these would be a labor of years; for they are all by his own hand, perhaps hardly aided by a disciple; and nothing can be more perfect than the outline and artistic distribution of the parts of the painting. What were these cartoons? Simply drawings for the loom. Raffaele did not think it below him to draw patterns which were to be sent to Holland or Belgium, and there to be executed in the loom by weavers of a carpet. This shows how the very highest ideal art may bend without degradation to assist practical art with all its powers and resources: and where the union of the two in the same person cannot be got, then we have to think of the means by which the harmonious combination of both may be brought to produce one effect. (Cheers.) While upon this subject, I am tempted to quote some beautiful lines on the subject from one of our oldest but wisest poets—one who calls himself, upon his tomb, “the servant of Queen Elizabeth, the councillor of King James, and the friend of Sir Philip Sidney”—Lord Brooke. Speaking as if it was considered in those days that the impulses of industry must be entirely regulated by the ruling power, he prescribes the duty of that in regard to the production of manufactures:—

* Continued from page 246, vol. 6, No. 4.

To which end, power must nurseries erect,
And those trades cherish which use many hands ;
Yet such, as more by pains than skill effect,
And so by spirits more than vigor stand ;
Whereby each creature may itself sustain,
And who excel, add honor to their gain.

Another remark I will read, which comes in the same passage, because it seems, as written in that age, prophetic of what may be considered the characteristic commercial policy of this day—that policy which particularly owes, if not its origin, certainly its greatest impulse to this city. (Cheers). He says:—

Now, though wise kings do by advantage play
With other states, by settling tax on toys,
Which, if needs do permit, they justly may,
As punishment for that vice which destroys,
*To real things yet must they careful be,
Here and abroad, to keep them custom free ;
Providing clothes and food no burthen bear,
Then, equally distributing of trade,
So as no one rule what we eat or wear,*
Or any town the gulf of all be made ;
For, though from few wealth soon be had and known,

And still the rich kept servile by their own,
Yet no one city rich, or exchequer full,
Gives states such credit, strength, or reputation,
As that far-seeing, long-breathed wisdom will,
Which, by the well disposing of creation,
Breathes universal wealth, gives all content,
Is both the mine and scale of government.

(This quotation was much applauded.)
Now, gentlemen (continued the Cardinal,) I wish to come to some general results. We have seen that, so far, in every instance we have examined, wherever there has been real beauty and perfection of work, it has been in consequence of the practical art and of the fine art, which ought to work together, being most closely combined, and as nearly as it can be done in the same individual, or else in the most perfectly harmonious co-operation. Now, we must watch very carefully whether the plans which are being proposed for artistic education—to be applied to production—will tend to combine these two characters better, or further to separate them. I come to the conclusion that, if art has always flourished in its perfection when the two have been combined—and if, on the other hand, it is acknowledged that, at present, art is not applied to manufactures as it might be—and if it is, at the same time, the clearly visible fact that our artisans and workmen are not artists—I think I

have a right to conclude that this separation of the two characters is the cause of our inferiority, and that, therefore, the education which we are to prepare for those who are to carry productive art to its perfection, must be one which will combine, closer than is now done, these two departments of what I consider one and the same thing. Now, is it, or can it be so, by the education we are now giving? I observed that what I have said till now has been acknowledged long before by one of the greatest authorities in matters of art—that is, Doctor Waagen, the director of the Royal Gallery at Berlin. He was examined in 1835, before a committee of the House of Commons on the improvement of arts and manufactures, and he said that “in former times artists were more workmen, and the workmen, were more artist, as in the time of Raffaele; and it is very desirable to restore this happy connection.” I was glad to find this corroboration of what I intended to say. He says again—“We have then, to endeavor to form a connection between these two, the productive and beautiful art.” Now, I ask what class of art was it which was in combination with art, to make it the parent of such a beautiful offspring in every department? It was not low art; it was not the mere knowing how to sketch an object from nature; it was not merely linear drawing; it was not mere elementary art, but it was high art, and the highest art. In every one of these cases the state of society was such—from what causes I do not undertake here to say—that it did permit the highest artist devoting themselves to what now they condemn and would despise: and, on the other hand, there was such honor given to the product of industry, that when it really had the stamp of beauty upon it, it rose of itself to the department of high art.

Let me illustrate what I consider the danger to be guarded against by another example. When you go into a picture gallery now, and you see the portrait of a man why do you care the least *who* that man was? You see the splendid effect; the countenance, which perhaps has not a beautiful feature in it, but which, by the noble expression, by the beautiful tone of color, by the majestic character thrown around the head, by the harmony between the parts, even by the accessories, is made

so glorious that you can gaze upon it for hours. It may be a Doge, it may be a merchant, a soldier, or a prince; you care not; you see there, not the portrait, but you see the painting by Titian, or by Rembrandt, or Vandyke, and the artistic merit so completely swallows up all the idea of personality of him who is represented, that, unless it happens to be some one particularly known, you never take the trouble of inquiring whom the painter represents. And why so? Because then portrait painting had not become a distinct department of art. There was no such thing then as a person who called himself a portrait painter, who thought he could produce a noble likeness of a man by merely giving a fac simile of his feature; but portraits were paintings by men who could have painted an historical picture of the highest character, and to whom it would have been thought not unbecoming to commit the greatest artistic works imaginable. But in modern times the portrait painter is an entirely different person, and the pictures produced by that class of artists are, unfortunately, of little value, except to those who have a personal interest in the subject of the portrait; you know, that every one of those portraits, which cover such a vast extent of the wall of the Exhibition, will be transferred to the place of honor, over the chimneypiece in the house of the owner, and when his son grows up, it will be put on one side, that a portrait of the inheritor may take its place, and in the next generation it will be transferred to some other more out-of-the-way corner of the house, until at last it will find a more ignominious position than Cæsar's dust stopping up a bunghole to keep out the inclemency of the weather. From what does this come? Simply from the attempt to divide art into parts—to say that there shall be a class of men who can do a portrait, but cannot do an historical or other great painting. And a difference when some of the great artists of the present day—for there are some truly great artists in England—do put their hands to what is considered another department of art, and paint the portrait of a friend, or of any one else—it becomes in itself a fine creation of art, and it will not perish when the person is forgotten; but it will be known by the name of the person who painted it, and not by

the name of the person who sat for it. In this way, too, high art, when applied to a lower branch, raises its character. This is what ought to be the fundamental basis to artistic education. If we really mean to make more than improved designers or draughtsmen for mechanical work, we must have great artists who are not afraid to work mechanically at the same time that they *are* great artists; we must have the feeling that art commits no unworthy condescension in giving immediate assistance to the processes of production. The famous artists of whom I have been speaking were, as we have seen, men who worked at their business, and yet were not considered as working men; they were considered as artists, and treated as such. And it is that, I am afraid, which makes the great difference between our time and theirs. Art, unfortunately, is not now considered so noble as to give rank and station, as it did in those days. I do not mean that the great artists, those who devote themselves to what are considered works of high art, do not receive patronage and countenance, and even high honor; but we find that in those days such distinctions were bestowed on artists *themselves* in productive toil. There is not, perhaps, any part of the history of art more interesting and beautiful than those portions of Cellini's which shows us the manner in which he was treated; he used to go when he pleased to the Pope to take him drawings and models; he speaks of going in without even waiting to be announced—going in the evening, after laboring all day in his workshop, as a matter of course. He was treated in the same manner by the Grand Duke of Tuscany, and by the King Francis the First; when he was working for him the King used to go at any hour and visit him; and Cellini gives rather a characteristic anecdote, proving how very familiar such visits were. One day, while at work, and, as usual, rather in ill temper, an apprentice or servant did something which displeased Cellini, and he roughly took the youth by the shoulders, and pushed him across the room. The apprentice fell against the door, which was just then opened by the king, and he fell fairly into the king's arms. Such was the familiar way in which kings and great personages used to visit Cellini, and find

him in his apron among his workmen. The difference between the social tone of our day and that of a former age cannot probably be overcome. I cannot, therefore, pretend to hope that we shall see the day when the real honest artisan who at the same time shows skill as well as industry, will be considered raised thereby above that condition in which he is at present held. (Cheers.) But I believe, myself, that it is not *patronage* which art wants in modern times. Patronage it has; you, gentlemen here, many of you, I know, would not scruple to go far beyond the mere calculation of interest, were it in your power to raise, by your patronage, any one who gave evidence of genius, and reward him as he deserved. It is not patronage, but honor, that art wants. (Cheers.)

Now, speaking of the department to which I have just alluded, there is a passage worth quoting from Mr. Ward's book, "The Work and its workshop," on the difference between English designers in the textile fabrics. "France has studiously cultivated the art of design, and advanced its professors to the rank of gentlemen; in England, on the contrary, with some exceptions, it has been degraded to a mechanical employment, and remunerated at weekly wages. France has, in consequence, a species of industry, to which we have no claim—the production of design for exportation." Now, having drawn these general conclusions, we must come to some practical applications. The first, that we must avoid making too great a separation between that character of art, which it is proposed, now, to impart to our products, and the higher department of arts. I have observed that the separation of art into two departments, high and low, seems to be dangerous, and it will perhaps, prove fatal. You may educate a great number of good designers, persons who will make tolerable drawings, and with rapidity; but the influence upon these which are considered the lower stages of art must come, not from below, but from above; it is only art in its highest department that gives the true feeling of proportion, the right sense of harmony, whether in color or design, that gives also that sense and feeling of the adaptation and propriety of things to their purpose, which is indispensable. Any one must be surprised at seeing the

extraordinary combination of the styles of different countries and times, in our works of art, from the want of a regular artistic education. I therefore, think, that the first thing which must be done is to try an education which will not give merely a great degree of elementary artistic power, but that, while we give what may be called the rudiments of art to every one, if possible, so as to give them all the opportunity of developing a higher taste and power, if they possess it, we must not, in looking beyond that, satisfy ourselves with the idea that we can educate a great number of artisans to a middling degree of artistic feeling, in the hope that thereby we may influence the character of our manufactures; but we must endeavor to combine the two, to bring down the high art to mingle with the lower, in the feeling that it is the common interest and duty of artists to improve the productive arts, and to carry into actual work—not merely into design—the powers which they possess (Cheers.)

The evidence of Mr. Skene, before the committee of the House of Commons, is to the same effect. He and Mr. Potter and every other writer I have seen, agree that we are not equal with the French in the more delicate operations of art applied to manufactures, and especially in the textile fabrics; and he gives this reason: "The system of France is very different from that of this country, because in France artists of the first eminence employ their time—and make it a most profitable part of their employment—in pattern drawing, and they are paid very high prices by the manufacturers." This, then, accounts for everything, because it is the union of high art in design with manufacture that makes the French superior. The evidence of M. Coquerel, who is himself an eminent architect and designer, shows that a distinguished artist, who became president of the French Academy of arts at Rome, and one of the first of his day, was employed at Sevres, in the china manufacture; and he states, also, that of fourteen or fifteen French artists of the first rank, educated at Rome, with whom he was acquainted, many were scattered through France assisting in the different manufactures—finding the market for the highest class of artistic works so limited, and so full, these men, instead of sinking

into despair, or committing suicide, as has been in similar cases, turned their high talent to the assistance and improvement of manufactures: and they are not thought to have dishonored themselves by doing so, nor is it considered their superior education was thrown away upon them, in qualifying them for the posts they now occupy. Why should it not be so here? Let any one go into the exhibition of paintings in London, and look around the walls, he will, perhaps, find only a small number of artists who can, with any hope of advancing themselves in the path to eminence, continue in what they may consider the highest department of art; and I cannot but think there are many in distress, persons, who might be making an honorable livelihood, if they would not wrongly consider, perhaps, a degrading employment, but which is most honorable,—the improvement of art in its productive department. (Cheers).

The second step, which seems to me of the greatest importance, is, to familiarize the people with art. This I know is a very trite topic, and one which can hardly be considered to require from us much attention. I know it is proposed to make museums in every part, and I think that excellent. But we must observe how it is, that familiarity with art has been obtained by other people; it has been, not so much by having places to which people were to go to see art, but by rendering it familiar everywhere to their eyes. The ancient Greeks, proceeding from other considerations, which we, as Christians, could not for a moment wish to have considered, such as the public spectacles, and feasts, and ceremonies of Greece, filled their whole country with works of art. Any one that will read the works of Pausanias or the first book alone, will see how it was impossible for an Athenian to go ten yards in any direction in the city without seeing some beautiful work of art. On every side there were monuments, and statues, and temples, of the most beautiful workmanship and design; and the people became impregnated with the sense of artistic beauty, and therefore whoever, even a mechanic, put his hand to any work, worked under the influence of that feeling. (Cheers.) In a later period there was the

same plan of filling the public buildings, the streets, and squares of the city, with sculptured monuments, and with paintings, hung up so that the people could gaze on them; and Pliny gives us a long list of paintings put up by different emperors; and, by way of showing what was thought by the Romans of our northern ancestors, he says, that among those paintings on the walls of the Forum there was one of a shepherd; and when a German ambassador came to Rome, he was asked at what price would *he* value that picture? Which shows that it was considered by the Romans to be worth a high price, quite beyond a German's estimate; he having so little idea of art that he did not consider that question applicable to any possible artistic merit, said, "Why, I would not have the man, if he were alive and breathing, if you would give him to me"—he considering it was the value of the man, as a servant, and not of the picture, that he was to regard. In a later age, at Florence, Vasari tells us how he and Michael Angelo, and other artists, used to meet together and then go from church to church to see the beautiful works of art in each, and then to discuss and criticise them. In the middle ages it was the *Church*, no doubt, which gave to public admiration the specimens of fine art, and kept them before the minds of all, and, in fact, made the people be artists. The consequence of this was, that, as Cellini tells us, when his statue of Perseus, after having been finished, was put into a public place, and when he uncovered it for the first time, "It so pleased God that as soon as ever my work was beheld by the populace they set up so loud a shout of applause that I began to be comforted for the mortifications I had undergone; and there were sonnets in my praise every day fastened up on the gate, and the very day I finished my work twenty more sonnets were set up, with the greatest praises of the work, and Latin and Greek poems were published on the occasion." So well had the Italian public learned how to appreciate a noble work of art!

Now, I look forward with no small expectation to what will be done by the new exhibition which is preparing, because I know that great pains have been taken to collect casts and copies of whatever is most beau-

ful in every department of art, beginning with the most remote period down to the present time; and if it be really open to the public, and if, especially, it be open for some portion, at least, *of that day on which alone the artisan can enjoy it*—(great cheering)—then I am sure it will do more towards raising the feeling of the people for art, and consequently towards introducing an improved practice, than any sets of lessons or any teaching could do. A very strong remark is made by Dr. Waagen, before that committee, when asked if they shut up the museum at Berlin as they do in England at certain times to enable artists to copy, he says, “By no means, because, I believe, art is far more promoted by the people seeing it than it is by any number of artists making copies.” But it appears to me there has been a deficiency in the general education among us in the matter of artistic culture. I cannot but be struck with this when I see that among all the colleges and schools belonging to this country, so respectable and richly endowed, there is not one of them, so far as I know, which has made any collection or museum that might train the young men who are educated there in a familiarity with art. I do not think any college in either of our Universities, Eton, or any of the schools, keeps before the eyes of its young men examples of painting, sculpture, and of other arts of design, which might accustom them during their early years to admire and appreciate art, and thus to contribute afterwards their influence to elevate its character. At the same time, I must observe with sincere pleasure that this is not the case with our Catholic colleges; that, poor and undowered as they are, there is not one of them which has not striven, at the same time while it has provided itself with a library, far beyond the proportion of its means, if compared with what others have done, to provide also some works of art, and keep them constantly before students. (Cheers.) At Stonyhurst there are many beautiful things, carving, lapidary, silver work, and jewellery, especially for church purposes. Ushaw, or St. Cuthbert's College, near Durham, is another instance; the walls there are covered with paintings, many of excellent masters, and engravings of great beauty; and there is a museum

filled with specimens of art; the sacristy of the chapel is growing with proofs of the encouragement given there to modern artists, as well as with carefully collected specimens of ancient art.

I may be allowed to revert also to the days which I spent in St. Mary's College, at Oscott. There, through the munificence of a departed nobleman, and under the guidance of the refined taste of the greatest artist of this day, because a practical disciple of all the arts—Mr. Pugin—(cheers)—there was collected a museum which would have been worthy of a larger establishment; beautiful specimens of carving, of enamelling, and metal work of every sort, so valuable that persons were sent from the department of practical art on purpose to make moulds and copies of the specimens; and almost all the cloisters were covered with paintings, some by very respectable artists, and others good copies. The students were thus brought up in familiarity with choice objects of art, which has had an influence upon their lives since, and induced them to patronise and encourage arts. That collection, moreover, was, in the most liberal way, thrown open to every one who choose to come and visit us; we never saw any feeling of narrow partisanship, or exclusiveness of religious distinction; the house used to be visited every day by parties of people from the neighborhood; and nothing gave me greater pleasure than to see the young men who used to come there, and who were permitted to walk freely through the house. There was, at no great distance, a very considerable establishment for education, richly endowed, and having everything that could encourage the study of literature; but it did not possess, as it appeared, a single object of artistic interest within its walls; and often did the students of that establishment come up to St. Mary's and roam freely through it, and receive every courtesy. And *that* was at a time when Oscott was considered almost the centre of a strong proselytising tendency, and I know that personally I was much more engaged in controversy than I am at the present moment; and it was pleasing, therefore, to see that there was no feeling on the subject which could make it to be apprehended for those young men to come to us. Bodies of those young men used to come to St.

Mary's, with letters from their principal, couched in the most courteous terms, asking, as a favor, that his students might be allowed to attend the establishment, which could have very little other merit to many than as it was filled with works of art; and on one occasion he informed me that, when any of the students of his house were particularly well conducted, and had especially distinguished themselves, the best reward he could give them was to send them with a letter to us, to come and see Oscott College. Now, it will give you all pleasure to know that this generous, liberal and gentlemanly-minded individual, the head of that neighboring college, was—the Rev. Prince Lee. (Immense cheering and laughter.)

One thing more, I will observe, is important, and that:—that we must not narrow the sphere of art. There is a tendency to do so in this practical scheme of education. I observed in the late report, which may be considered as a programme of the department of practical art, that there are prizes proposed for artistic designs in three different departments—for printed garments, fabrics for carpets, and for paper hangings. Now, one of the conditions of the four drawings to be sent in to compete for the prize in all three instances is this, “the designs to be flat, not imitative, but conventional, without relief, shadow, or perspective. Now, that is the mediæval principle, and cannot apply to other styles of art; and we are narrowing the sphere of art if you dictate, as a necessary rule of all designs in those three departments of productive art, that there shall not be relief or perspective in the painting—that the flowers must all be of one color, and that there must be no shadow, and no attempt to copy nature, but that the forms must be all “conventional,” that is, such as a rose spread out into four parts, with a point between them, and the lily changed into a *fleur de lis*, and no natural forms to be truly imitated. Now, it is folly to think of competing with French art if our artisans are to be educated on that principle, because the beauty of design, where nature is copied—where the flower glows in its own colors—will carry the taste of the public, and I think rightly, in preference to a series of flat and unshaded de-

signs—I think it is a wrong principle; and why? Artists will tell you that the carpet is nothing more than a back-ground for furniture—and therefore that these must be quiet and of a lower tint, with nothing brilliant, and no attempt at the representation of natural objects. Now, I deny this principle; they are not back-grounds. The papering of the wall is in the place of the ancient painting on the wall; and I do not see why, if you only avoid whatever may offend the eye—such as false perspective—there should not be all the beauty and glow of natural objects given to the pictured papering of the wall. If we are to collect museums, to put before our young artists specimens from the paintings of Pompeii, and then to tell them that these wall paintings are done on a false principle, because they are good representations of natural objects, and not merely conventional drawings, how are we consistent? And, if you tell a young man who designs patterns for carpets that there must be nothing there which would not be, naturally, in such a position—that there must be no sky or flowers—then you go to make it a mere pavement and nothing better. I should say that the real carpet should take the place of the ancient mosaic. The ancients thought it not amiss to represent whole scenes on their pavement, with sky and rivers, men and horses; and Pliny tells us that there were many celebrated men for this sort of work in Greece; but the most celebrated of all was Sosias; and he says among his other works at Pergamus there was a remarkable one which was called ‘The Unswept House.’ It was a representation which certainly does not give us a very good idea of cleanliness of domestic habits—if a floor on which all sorts of refuse had been left to lie about, fragments of meat, and the shells of crawfish, and everything which untidy people might leave after their meals. Such were the notions the ancients had of designs. I should, therefore, be inclined to fear that if we began to deal with art upon a too confined basis, and on principles which belong only to one period of the history of art—and if we now insist on their being made the sole basis of artistic education—we shall produce cramped and narrow-minded artists, and never ena-

ble them to take advantage of great classical patterns to improve their taste. (Cheers.)

In concluding, I think among the greatest errors that language has imposed upon us there is none more remarkable than the sort of antagonism which is established in common language as between nature and art. We speak of art as being in a certain manner, the rival of nature, and opposed to it; we contrast them—we speak of the superiority of nature and depreciate art as compared with it. On the other hand, what is art but the effort which is made by human skill to seize upon the transitory features of nature, to give them the stamp of perpetuity? If we study nature we see that in her general laws she is unchangeable; the year goes on its course, and day after day pass magnificently through the same revolutions. But there is not one single moment in which either nature, or anything that belongs to her, is stationary. The earth, the planets, and the sun and moon, are not for any instant in exactly the same relation mutually as they were in another instant. The face of nature is constantly changing; and what is it that preserves that for us but art, which is not the rival, but the child, as well as the handmaid of nature? You find, when you watch the setting sun, how beautiful and how bright for an instant!—then, how it fades away!—the sky and seas are covered with darkness, and the departed light is reflected, as it had been just now upon the water, still upon your mind. In that one evanescent moment a Claude or a Stanfield dips his pencil in the glowing sky, and transfers its hue to his canvass; and ages after, by the lamp of night, or in the brightness of the morning, we can contemplate that evening scene of nature, and again renew in ourselves all emotions which they readily could impart. And so it is with every other object. Each of us is, but for the present moment, the same as he is in this instant of his personal existence through which he is now passing. He is the child, the boy, the man, the aged one bending feebly over the last few steps of his career. You wish to possess him as he is now, in his youthful vigor, or in the maturity of his wisdom, and a Rembrandt, or a Titian, or a Herbert seizes

that moment of grace, or of beauty, or of sage experience; and he stamps indelibly that loved image on his canvass; and for generations it is gazed on with admiration and with love. We do not pretend to fight against nature, and to say that we will make art different from what she is. I will read you some beautiful lines, which show our art must be derived from nature. I translate them from the excellent poem of Schiller, addressed to artists:—

The choicest blossom, which the parterre warms,
In one rich posy skilfully combined—

Such, infant Art crept first from Nature's arms,

Then are the posies in one wreath entwined.

A second Art, in manlier bearing stands,
Fair work of men, created in his hands.

I believe the idea of these lines is taken from the anecdote which Pliny has preserved to us of the contest of art between Pausias the painter and Glycera the flower girl; she used to combine her flowers with such exquisite beauty, that they excited the admiration of her naturally-instructed fingers; and then she, in her turn, again would rival the picture, and produce a more beautiful bouquet still; and the painter, with his pencil, would again rival her, and produce by his art the same effect as she had done with the flowers of nature. Consequently, while religion is the greatest and noblest mode in which we acknowledge the magnificent and all-wise majesty of God, and what He has done for the spiritual and the physical existence of man, let us look upon Art as but the most graceful and natural tribute of homage we can pay to Him for the beauties which He has so lavishly scattered over creation. Art, then, is to my mind, and I trust to you all, a sacred and a reverend thing, and one which must be treated with all nobleness of feeling and with all dignity of our art must always be tending higher and higher; we must fear the possibility of our creating a mere lower department, instead of endeavoring to blend and harmonize every department, so that there shall cease to exist in the minds of men the distinction between higher and lower art. I will conclude with another beautiful sentiment from the same poem:—

The bee may teach thee an industrious care;
The worm, in skill, thy master thou must own;
With higher spirits, wisdom thou dost share,
But Art, oh man, hast thou alone.

HELIOTYPE, FILTERING OF BATHS, CLEANING OF GLASSES, TRANSFER OF PROOFS UPON BLACKENED IRON PLATES.

Translated from the French of La Lumiere by Miss M. Corlies.



NAME heliotype, the apparatus that I have invented for the production of positive proofs upon collodion by means of a negative traversed by direct solar rays, or those reflected from a looking glass. I have tried an aperture placed at the distance of a decimetre in front of the negative, being able to enlarge or diminish it at will by

means of a piece of muslin; the frame having the opening being fixed horizontally; in working it with the hand, it is difficult to obtain an uniform movement; with a spring of vulcanized india rubber, the movement is sufficiently accelerated; I have succeeded best in employing the sun reflected by a glass, and received into the apparatus, at the bottom of a dark piece, leaving the negative uncovered during the fraction of a second, by means of a screen of black *porcelaine* doubled many times; the duration of the time of making the impression is found to be too long, it is true; but this means will succeed very well by placing in front of the negative a very clear yellow glass, or better still by covering the negative with a yellow varnish.

With the unvarnished negatives in collodion, the proofs are not neat, especially if these negatives are upon window glass. They ought to be upon plate glass, and the varnish must be put in excess and placed to dry, upon a level support.

I have obtained, by means of the electric light rendered parallel by a parabolic mirror, positive proofs upon glass of an incomparable firmness; the negatives were not varnished but they were upon glass, the normal size of the metal plate and upon albumen; these negatives were obtained by M. Renard; and by reason of the care of that skillful photographer, the bed was found almost as smooth as the glass itself. At a centimetre distance, the image formed by the solar rays was still very pure; but at a decimetre, it became confused. It was neces-

sary then to place the bed of collodion as near as possible to the back of the negative. The interposition of a straw colored glass, or of a varnish of the same tint, will permit the exposition to the sun to be protracted some seconds; a glass of orange yellow retards too much; it requires a minute with rapid collodions, and during this time the sun sensibly changes place.

To transfer proofs upon paper, it is most important that the collodion should be strong so as to be doubled without being torn, and to make it adhere to the paper some weak water containing a little sugar should be poured on the collodion on taking it from the bath.

Sulphate of iron will suffice to give proofs of a beautiful black, without employing bichloride of mercury and hyposulphite, but the sulphate of iron must be very weak, obtained by adding acetic acid; the green sulphate of iron which I make use of to give the beautiful lights to the dried positive proofs upon glass, and which contains sulphuric acid and nitric acid, gives a red tone to the proofs.

Proofs upon glass, of small dimensions, require that the metallic plates should be placed in baths on the top of the collodion, consequently it is important that these baths be exempt from precipitates and crystals, which deposit upon the metallic plate and often produce little breaks in it: it is to this cause must be attributed those lights with which certain proofs are pierced; it will be then advantageous to employ for each proof baths of silver, sulphate of iron and hyposulphite newly filtered. For amateurs simply three flasks with large openings for receiving a funnel trimmed with cotton, will be sufficient; the funnel should be placed upon a fixed post not resting upon the flasks; but it is necessary always to seize at the same time both the flask and the funnel, when you wish to pour the fluid into the basin, and when the funnel filters, we cannot avoid the liquids spreading which is always disagreeable. The reservoirs with stop-cocks are

very dear ; in place of this I proposed the following plan. Take a flask with three tubes : upon the middle tube fix a funnel trimmed with cotton and fastened in a cork stopper shutting very closely, and cemented if necessary. The lateral tube at the right must be provided with a glass siphon to pour the liquid into the wash-basin, and the lateral tube to the left must receive a vertical tube, terminated on its upper part by an india rubber ball having a hole of five millimetres in diameter pierced with a warm iron ; this hole, placed in the middle of the ball must be stopped by the thumb of the left hand ; when we press the india rubber ball, the air crowded into the vase will react immediately and make the liquid run through the siphon. The vertical tube should be flat at its lower extremity, to diminish the size of the opening, and avoid the ascent of the liquid into the gum elastic ball. When the hand ceases to press, in order to permit the air to enter by the hole, it is understood that the tubes must be well closed in the corks, and that the corks must themselves shut out all passage of air.

Gum elastic balls have become very rare in Paris ; they may be supplied by balls of vulcanized india rubber that I am going to fabricate at once, with the intention of using them with a slight modification for the drying of flasks, an operation so useful for the preparation and employment of collodion, and, which is at present effected by a very expensive washing with alcohol.

I have often used baths full of sediment, which obliged me to place my collodion beneath ; but I always had grey streaks, which at length I discovered were owing to the bubbles of air which touched or glided over the plate at the moment of its immersion in the bath of silver ; it is therefore important to execute this operation with continuity but gently.

The filtered baths have the advantage of being exempt from little spots on their surface. It is entirely superfluous to be troubled by the contact of the air with these baths, for *the purest and most rapid proof I ever made was obtained with a bath left for a month to the open air so that it was completely dried and crystallized. I did nothing but add to it a little rain water ; the crystal took a yellowish green tinge and the bath became troubled,*

but employed in this state, that is to say, well saturated with iodide, or chloride of bromine it gave me images of unheard of transparency. My apparatus, put into the garden, which is surrounded with high houses, at seven o'clock in the morning, at the moment when it was completely in the shade, (and with a little opening of a millimetre, which requires a minute with the plate, for objects in full sunshine,) has given me, in two minutes, a complete proof in which there was not wanting a leaf nor a spring of grass.

I had, it is true, rubbed carefully these plates with a paste formed of powder of sapphire to polish the plate and with rectified alcohol, left to dry, wiped with a cotton rag and washed perfectly clear. This rubbing is good for the plates that are greasy, but it is superfluous for the plates which have been put to soak in clear water. If in taking them out, and letting them drain, the water covers them in a continuous sheet, we can be certain that they are clean, the drying and the rubbing with linen, almost new and washed clean, assisting with the breath, gives glasses perfectly clean.

The breath is very good for testing the fitness of the glass ; for that a glass may be good enough to be made use of it is necessary that the breath condensed on its surface should not make any inequality appear, and is evaporated very uniformly ; it is useless to rub it out again when the glass has undergone this test for the new rubbing will not guarantee it and I have acquired the certainty that the collodion deposited after the breathing gives beautiful proofs.

We can transfer the positive proofs upon any smooth surface whatever with a black ground ; but it is necessary for success that the collodion should be sufficiently solid to be doubled upon the piece or better still, to detach itself, of itself, from the glass and float in the air without being torn.

By this means, I have succeeded in transferring proofs upon plates of very thin iron upon which I had first put a black varnish ; these plates were not sufficiently smooth to take away the skin of collodion by doubling it up ; besides this process fails always when we press out the water, that is between the collodion and the glass in order to shut out the bubbles of air. After having placed my sheet of thin iron

upon the collodion, I place the whole in a basin full of water, the glass below; by shaking the basin gently, the collodion is soon detached and adheres to the sheet of thin iron, which is free from water, being covered with the proof. And having drained the iron plate and spread the collodion, if it produces folds, the plates must be warmed on top, by means of a spirit lamp by degrees the water is vaporised, and finally the varnish sinks down and is applied to the collodion, and incorporated so well with it that the nail cannot dent the proof. The shades becomes very beautiful,

especially after polishing with dry cotton which takes away all the dust, that the water can have deposited on the surface of the proof.

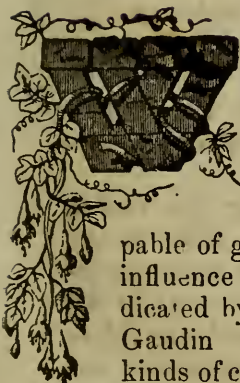
The thin sheets of red copper, made smooth and varnished with care, would give still more beautiful results, for the thin iron plate is always a little rough, and the difference of price, when so thin, would be almost inappreciable.

Proofs thus transferred upon varnished copper would be superior to everything which has been done hitherto, for solidity.

M. A. GAUDIN.

From the Journal of the Photographic Society.

EXPOSITION OF THE COLLODION PLATE.



WHEN an excited plate is allowed to dry, the nitrate of silver crystalizes over it and the iodide of silver contained in the collodion becomes so decomposed that it is no longer ca-

pable of giving an image under the influence of light. The process indicated by M. Girod seems to M. Gaudin impracticable with most kinds of collodion, since he has found them torn or injured by the slightest contact of a solid body.

M. Gaudin had already intended to study the influence of time on an excited plate, when an opportunity accidentally presented itself of making the trial in the course of his experiments upon the production of direct positive prints on glass.

He had excited a plate and placed a negative above it, then an orange yellow glass, interposing bands of the thickest filtering paper being obliged to go out of doors to avail himself of the sun's rays and to reflect them into a dark place, he wrapped the three plates of glass, with the red glass support of the excited plate, in several folds of linen; the sun then became overcast and compelled him to give up the

attempt for that day. He intended to complete the experiment next day, provided the collodion seemed unaltered. Thus covered up, the collodion could not dry, especially as the laboratory was on the ground-floor, and very damp. He therefore left the whole lying flat, till the same hour next day. For the sake of exactitude he made a point of completing the trial in twenty-four hours after.

When the collodion was examined it appeared very clean; tried with the finger it was found still soft, but without a particle of liquid on the surface, the thick absorbent paper accounting for this. M. Gaudin then felt no doubt of obtaining a visible print and in fact, after three minutes exposure to the sun with the yellow glass, and passage through sulphate of iron a print was obtained, as usual, less marked but very clear, and the author was led to conclude that excited collodion may be employed for many hours after its preparation, with no other disadvantage than a diminution of the sensitiveness, provided the plates are kept in a closed case, which necessarily becomes saturated with vapor to the point which maintains the excited layer in a permanent state of humidity. The plate above mentioned appeared from the

character of the impression, about one-third as sensitive as a plate recently prepared.

Hence M. Gaudin proposes, for operating at a distance, to prepare a number of plates, and arrange them one above another, preferably in a horizontal position,

to prevent the pellicle of liquid flowing off, in a glass box, well closed so as to prevent evaporation. It might be advantageous, with well made frames, to place each glass in its frame (or shutter) beforehand, taking care to keep the whole in a horizontal position.

TO THE EDITOR OF THE JOURNAL OF
THE PHOTOGRAPHIC SOCIETY.

FLORIAN, *Torquay*.

SIR,—I must apologize to you for a mistake I made the other day in putting up the wrong copy of my letter to you in which the formulæ were not quite correctly stated, so I shall feel much obliged if you will do me the favor of inserting the following corrections.

Take.

Iodide of ammonium 45 grs.

Bromide of ammonium . . 12 "

Chloride of ammonium . . 1 gr.

Alcohol 1 oz.

Dissolve and add as much freshly-precipitated iodide of silver as it will take up.

Or else take

Iodide of ammonium 50 grs.

Bromide of ammonium . . 12 "

Alcohol 1 oz.

Dissolve in this as much chloride of silver as it will take up.

In the formulæ for the developing fluids I use 1 oz., not $\frac{1}{2}$ oz., of formic acid but as the strength is rather under the average, a safer proportion is 6 drachms to 10 ounces of developer. There is a slight typographical error on your part in saying 1 oz instead of 10oz. of water in the protosulphate of iron. I will now request you to add a plan I find very successful, by which even the weakest and most instantaneous picture may be made to print, a point I think but imperfectly attained by the use of terchloride of gold. I first of all whiten the picture by means of the solution of bichloride of mercury in hydrochloric acid, of which, according to Archer's method, I take one part to six of water, and then after well washing the plate, I pour on a

weak solution containing about 2 grs. to the ounce of iodide of potassium; by this means a fine yellow picture is produced quite impervious to actinic rays. I may add, that a piece of glass coated with collodion, sensitized, exposed to diffused daylight for a second and then developed, whitened, and thus made yellow and varnished, forms a capital window for a dark chamber.

I remain,

Yours obediently,

F. MAXWELL-LYTE.

LIVERPOOL, Sept. 29, 1853.

SIR,—A few words in reply to your correspondence G. M. L.

The only effect of planting the staff in the position which he states, would be the lessening the amount of the apparent attraction of the positions of the staff in the two observations, and thus rendering it less accurate. On this head I may further observe, that if he again refers to my article in No. 8 of your journal, he will find that I most clearly imply that the staff is to be placed in such a position that the light emanating therefrom *shall not enter the lens*; it therefore cannot in any way form a part of the picture taken. I can conceive of several reasons why there should be the strictest analogy between pictures produced on the return of the eyes and those taken to form stereoscopic pictures; and only in the proportion that this analogy exists, in the same proportion do the pictures taken for the stereoscope give correct impressions; but I cannot conceive of one reason to the contrary. Perhaps your correspondent can enlighten me on the subject.

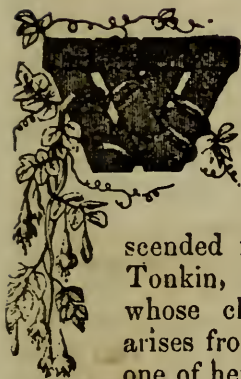
I conceive that the difficulty mentioned by your correspondent, in losing an impression of depth, space and thickness in a landscape when viewing it with one eye only, arises from the education which the eye (so to speak) has undergone. Let him resolutely dispossess himself of what he *knows* are the characteristics of the lands-

cape and all will appear perfectly flat, excepting in an extensive view, where the *back* ground being less distinct than the *fore* ground, will, from the circumstance, convey some sensation of distance.

Your obedient Servant,
GEORGE S. WOOD.

LIFE OF JOHN OPFY (or OPIE.)

BY A. CUNNINGHAM.



AS born in the parish of St. Agnes, about seven miles from the town of Truro in Cornwall, in 1761. His father and grandfather were carpenters; his mother was descended from the ancient family of Tonkin, in the same district, but whose chief claim to distinction arises from a county history, which one of her relatives wrote, and which remains unfinished, as well as unpublished, in the hands of Lord De Dunstanville. Of his mother's claim to high provincial descent he was either ignorant or disdainful; for his widow—a name of some note in literature—confesses that she was made acquainted with it for the first time by a brief sketch of his character, published after his death by Mr. Prince Hoare.

He appears to have been regarded among his rustic companions as a kind of parochial wonder from his early years. At the age of twelve he had mastered Euclid, and was considered so skilful in arithmetic and penmanship, that he commenced an evening school for the instruction of the peasants of the parish of St. Agnes. His father—a blunt mechanic—seems to have misunderstood all these indications of mental superiority, and wished him to leave the pen for the plane and the saw; and it would appear that his paternal desires were for some time obeyed, for John accompanied, at least, his father to his work:

but this was when he was very young, and it seems probable that he disliked the business since his father had to chastise him for making ludicrous drawings with red chalk on the deals which were planed up for use.

His love of art came upon him early. When he was ten years old he saw Mark Oates—an elder companion, and now a Captain of Marines—draw a butterfly; he looked anxiously on, and exclaimed, "I think can I draw a butterfly as well as Mark Oates?" he took a pencil, tried, succeeded, and ran breathless home to tell his mother what he had done. Soon afterward he saw a picture of a farmyard in a house in Truro where his father was at work; he looked and looked—went away—returned again and looked—and seemed unwilling to be out of sight of this prodigy. For this forwardness his father—whose hand seems to have been ever ready in that way—gave him a sharp chastisement; but the lady of the house interposed, and indulged the boy with another look. On returning home he procured cloth and colors, and made a tolerable copy of the painting from memory alone. He likewise attempted original delineations from life; and, by degrees, hung the humble dwelling round with likenesses of his relatives and companions, much to the pleasure of his uncle, a man with sense and knowledge above his condition, but greatly to the vexation of his father, who could not comprehend the merit of such an idle trade.

Of the early days of

"The Cornish Boy in tin mines bred,"

as Wolcot describes him, we have various and conflicting accounts. The Professor of Ancient History in the Royal Academy says that he followed his studies in art with much ardor, and that his sketches attracted the notice of Wolcot (Peter Pindar), then residing as a physician in Truro, whose knowledge in painting and sound judgment were of great advantage to the young scholar. A rougher man tells a ruder story. "Dr. Wolcot," says Smith, "compassionately took him as a lad to clean knives, feed the dog, &c., purposely to screen him from the beating his father would now and then give him for chalking the sawpit all over. Oppy—for so we must for the present call him—always staid a long time when he went to the slaughter house for paunches for the dog: at last the Doctor was so wonderfully pleased by John's bringing him home an astonishing likeness of his fiend the carcass butcher, that he condescended to sit to him, and the production was equally surprising." Some such story as this was related by Wolcot himself, in his half-grave and half-humorous way, at the period when the subject of this memoir was high in fame; but as his purpose was to rebuke the pride of the successful artist, his account must be received with some caution. It is certain, however, that our painter lived while a boy as a menial in the satirist's family, and gained his good-will by his talents.

How long he remained with Wolcot has not been mentioned. When yet very young, we find him commenced portrait painter by profession, and wandering from town to town in quest of employment. "One of these expeditions," says Prince Hoare, "was to Padstow, whither he set forward, dressed as usual in a boy's plain short jacket, and carrying with him all proper apparatus for portrait painting. Here, among others, he painted the whole household of the ancient and respectable family of *Prideaux*, even to the dogs and cats of the family. He remained so long absent from home, that some uneasiness began to arise on his account, but it was dissipated by his returning dressed in a handsome coat, with very long skirts, laced ruffles, and silk stockings. On see-

ing his mother he ran to her, and taking out of his pocket twenty guineas which he had earned by his pencil, he desired her to keep them: adding, that in future he should maintain himself."

For his mother he always entertained the deepest affection—and neither age nor the pressure of worldly business diminished his enthusiasm in the least. He loved to speak of the mildness of her nature and the tenderness of her heart—of her love of truth and her maternal circumspection. He delighted to recall her epithets of fondness, and relate how she watched over him when a boy, and warmed his gloves and great coat in the winter mornings on his departure for school. This good woman lived to the age of ninety-two, enjoyed the fame of her son, and was gladdened with his bounty.

Of those early efforts good judges have spoken with much approbation;—they were deficient in grace, but true to nature, and remarkable for their fidelity of resemblance. He painted with small pencils, and finished more highly than when his hand had attained more mastery. Lord Bateman was one of his earliest patrons, and employed him to paint old men and traveling mendicants: sitters such as those neither alarmed the rustic artist with their dignity, nor annoyed him with their remarks—they sat in silent wonder, and beheld the second creation of their persons—then rose, and thought him a wondrous lad. By this practice his hand attained that ready and dashing freedom of manner, which was so much his friend when more fastidious heads came to his easel. His usual price, when he was sixteen years of age, was seven shillings and sixpence for a portrait. But of all the works which he painted in those probationary days, that which won the admiration of the good people of Truro most was a parrot walking down his perch: all the living parrots that saw it acknowledged the resemblance. So much was he charmed with his pursuit and his prospects, that when Wolcot asked him how he liked painting, "Better," he answered, "than bread and meat."

In the twentieth year of his age our limner formed the resolution of visiting London, and set out for the great city under the protection of Wolcot. It is said, that the poet and the painter held a

consultation upon the rustic sound of Oppy, and both uniting in opinion that it was vulgar and unmusical, changed it to Opie—a name owned by an old Cornish family. The alteration was immaterial, for they are both evidently the same name: but under all the external advantages which Opie could claim over Oppy, he was presented to Sir Joshua Reynolds. He had not as yet determined on having himself announced, in the blazonry of prose and verse, as the “Wonderful Cornishman,” on whom nature had spontaneously, without study, dropped down the gifts of art: the President received him courteously, gave him some advice, and desired to see him again. He evidently did not consider this new marvel at all marvellous.

To rise by silent and slow degrees to fame suited ill with the rustic impatience of Opie, and worse with the vanity of Wolcot, who desired to amaze the town by proclaiming a prodigy. Peter Pindar was right for once. Nothing is more capricious than public taste: its huge appetite for wonders requires daily food; and it swallows all with the ravenous avidity with which the giant gulped the wine of Ulysses, and cried, with his half-breathless voice, “More!—Give me more!—This is divine!” Even if the candidate for its fickle approbation wants original genius to carry him triumphantly onwards, he may, nevertheless, have address enough to secure a fortune before his deficiency is discovered—or the buzz rises on the appearance of another new wonder. All this was present to the mind of the sagacious satirist: he took his measure accordingly, and the wealthy and titled hordes, who professed taste and virtue, and were absolute in art and literature, came swarming out to behold “the Cornish Wonder”—for as such the patron announced the painter.

Of the success of this manœuvre Northcote gives this graphic account:—“The novelty and originality of manner in his pictures, added to his great abilities, drew a universal attention from the connoisseurs, and he was immediately surrounded and employed by all the principal nobility of England. When he ceased, and that was soon, to be a novelty, the capricious public left him in disgust. They now looked out for his defects alone—and he

became, in his turn, totally neglected and forgotten; and, instead of being the sole object of public attention, and having the street where he lived so crowded with coaches of the nobility as to become a real nuisance to the neighborhood, ‘so,’ as he jestingly observed to me, ‘that he thought he must place cannon at the door to keep the multitude off from it,’ he now found himself as entirely deserted as if his house had been infected with the plague. Such is the world!” His popularity was not, however, so very brief as this description would induce us to infer. Some time elapsed before he executed his commissions. When the wonder of the town began to abate, the country came gaping in; and ere he wearied both, he had augmented the original thirty guineas with which he commenced the adventure, to a very comfortable sum; had furnished a house in Orange Court, Leicester Fields; and was every way in a condition to bid immediate want defiance.

The first use which he made of his success was to spread comfort around his mother; and then he proceeded with his works and his studies like one resolved to deserve the distinction which he had obtained. His own strong natural sense, and powers of observation, enabled him to lift the veil which the ignorant admiration of the multitude had thrown over his defects: he saw where he was weak—and labored most diligently to improve himself. His progress was great—and visible to all, save the leaders of taste and fashion. When his works were crude and unstudied, their applause was deafening; when they were such as really merited a place in public galleries, the world, resolved not to be infatuated twice with the same object, paid him a cold, or at least a very moderate, attention. “Reynolds,” says Watton, the sculptor, “is the only eminent painter who has been able to charm back the public to himself after they were tired of him.” The somewhat rough and unaccommodating manners of Opie were in his way to fortune: it requires delicate feet to tread the path of portraiture; and we must remember that he was a peasant unacquainted with the elegance of learning, and unpolished by intercourse with the courtesies and amenities of polite life. Of this he could learn little in his father’s cottage;

and Wolcot, whose skill lay in coarse satiric verse, in boisterous humor, and in profane swearing, could be but an indifferent instructor. He was thrown into the drawing-room, rough and rude as he came from the hills of Cornwall, and had to acquit himself as well as he could.

I can hardly believe all that has been said as to that fear of heart and fervor of spirit which were upon Opie when he found himself fanned for the first time with dutchesses' plumes, and enclosed in a glittering circle of garters and stars. A weak man might have been bewildered, and a very vain man too much elated—but he was neither weak nor vain; and it is apparent that he made no efforts to accommodate himself to the atmosphere which he has been described as breathing with such superfluity of respect.

Indeed, he appears to have been a plain, bold man, with a moderate share of sensitiveness. "His habitual ruggedness of address," observes Mrs. Inchbald, "was stigmatized by the courtly obtained observer with the appellation of ill-breeding, while a plainer and wiser description of persons found in this contempt of affectation such a security from design—either upon their hearts or their understandings—that they willingly yielded him both; and they made this sacrifice with a kind of joyful astonishment to observe that where the Graces never appeared, the Virtues acted for them. This natural blemish in the man—this habitual ruggedness of manner appeared—to Northcote only the effect of an honest indignation towards that which he conceived to be error. It, however, made its appearance early in life, and seems to have been inherited from his father, who, according to all accounts, was coarse and unaccommodating. One Sunday afternoon, while his mother was at church, Mr. Opie, then a boy of ten or eleven years old, who fixed his materials for painting in a little kitchen, directly opposite the parlor where his father sat reading the Bible. He went on drawing till he had finished every thing but the head, and when he came to that, he frequently ran into the parlor to look up in his father's face. He repeated this extraordinary interruption so often, that the old man became quite angry, and threatened to correct him severely if he did the

like again. This was exactly what the young artist wanted. He wished to paint his father's eyes when lighted up and sparkling with indignation: and having obtained his end, he quietly resumed his task. He had completed his picture before his mother's return from church, and on her entering the house, he set it before her. She knew it instantly; but, ever true to her principles, she was very angry with him for having painted on Sunday, thereby profaning the Sabbath-day. The child, however, was so elated by his success, that he disregarded her remonstrance, and hanging fondly round her neck, he was alive only to the pleasure she had given him, by owning the strength of the resemblance. At this moment his father entered the room and recognising his own portrait, immediately highly approved of his son's amusement during the afternoon, and exhibited the picture with ever-new satisfaction to all who came to the house; while the story of his anger at interruptions, so happily excused and accounted for, added interest to his narrative and gratified still more the pride of the artist."

I would fain disbelieve this story; but it comes too well authenticated to be omitted in a narrative whose object is truth. To think of a child deliberately putting its father in a passion that it might copy the sparkling indignation of his eyes! and a wife, and a loving one, recording the trick of this sucking incendiary as a thing pleasant and meritorious! The rod must, after all, have been a necessary piece of furniture in the household of the carpenter of St. Agnes!

Opie, having conquered the chief difficulties of his profession, and acquired a knowledge of French, and a smattering of Latin, now found leisure to become sensible of a want which London could easily supply. It is reported that love of money first directed his eyes to the daughter of a pawnbroker who lived in his neighborhood. Neither his courtship nor his marriage have been alluded to by his biographers; the first was short, and the second unhappy. His wife, a little woman, with very dark eyes, and a handsome portion, had a mind of her own as well as the artist; and, loving gayety, was not disposed to shut herself up from sun and air with a man of morose

turn, whose whole time was dedicated to the study of the hard masters. It is said that a kind word, and an affectionate shake by the hand, banished from his mind in general the remembrance of a wrong committed against him; and that such was his placability of nature, that he was willing to confide again in those who unworthily betrayed him. His wife, a childless and giddy woman, soon put his charity to the extreme proof; and he was compelled to sue for a divorce.

That domestic sorrow such as this had a serious influence upon his studies, who can doubt? but those who have drawn and delineated his life, avoid any allusion to his frail partner; they had knowledge and declined to use it—they were over-sensitive, and have not done justice to the memory of Opie by this omission. The only allusion to the circumstance is contained in one of the painter's own smart sayings. He was passing the church of St. Giles late one evening, in the company of a friend of avowed skeptical opinions. "I was *married* at that church," observed Opie. "And I was *christened* there," said his companion. "Indeed!" answered the painter, "it seems they make unsure work at that church as it neither holds in wedlock nor in baptism!"

Having freed himself from the encumbrance of an unfaithful wife, and got rid of the crowds of carriages which filled up the street, and annoyed the neighbors, he divided his time between his profession and the cultivation of his mind. He was conscious of his defective education; and, like Reynolds, desired to repair it, by mingling in the company of men of learning and talent, and by the careful perusal of the noblest writers. "Such," says his best biographer, "were the powers of his memory, that he remembered all he had read: and Milton, Shakspeare, Dryden, Pope, Cowper, Butler, Burke, and Dr. Johnson, he might, to use a familiar expression, be said to know by heart. A man of powerful understanding and ready apprehension who remembered all he read, and who had nine of the greatest and most voluminous of our authors by heart, could never be at any loss in company, if he had tolerable skill in using his stores.

To his intellectual vigor we have strong testimony. "Mr. Opie crowds more wis-

dom," said Horne Tooke, "into a few words, than almost any man I ever knew—he speaks as it were axioms—and what he observes, is worthy to be remembered." "Had Mr. Opie turned his powers of mind," says Sir James Mackintosh, "to the study of philosophy, he would have been one of the first philosophers of the age. I was never more struck than with his original manner of thinking and expressing himself in conversation; and had he written on the subject, he would, perhaps, have thrown more light on the philosophy of his art than any man living." "He aimed at no competition with the learned," says Amelia Opie, "while with a manly simplicity, which neither feared contempt nor courted applause, he has often, even in such company, made observations, originating in the native treasures of his own mind, which learning could not teach, and which learning alone could not enable its possessor to appreciate."

At the period of his first appearance there was considerable encouragement for works of an historical nature; West, Barry, Fuseli, and, occasionally Reynolds, produced such—with more or less success and applause. That this high feeling has now greatly subsided in England there can be no doubt; even during the lifetime of Opie, commissions, as they are called, for such pictures, were becoming more and more rare; and now alas!—it is sufficient to mention two of the more striking instances—the "Satan" of Lawrence, and the "Fall of Ninevah" of Martin, remain in their studies. Opie, anxious for fame, and yet resolved to live, did well then in dividing his pencil between portraiture and history.

His chief excellence lies in the former; there he has great breadth, vigor, and natural force of character—touched, it must be allowed, in some instances, with a certain air of village audacity, which comes from the artist rather than from the sitter. His old men's heads, half fancy and half portrait, are deficient in carefulness of finish; but this is more than compensated by that rough and happy energy with which they are dashed out. They furnish no comparisons—such as critics love to make—with the works of Velasquez, or Vandyke, or Reynolds; they have a better claim to distinction—they are truly original produc-

tions. His portrait of Charles Fox has been justly commended, nor does the circumstance of his having completed the likeness from the bust by Nollekens, as related by Smith, diminish his merit. When Fox, who sat opposite to Opie at the Academy dinner given in the exhibition-room, heard the general applause which his portrait obtained, he remembered that he had given him less of his time than the painter had requested, and said across the table, "There, Mr. Opie, you see I was right; every body thinks it could not be better. Now, if I had minded you, and consented to sit again, you most probably would have spoiled the picture." While this far-famed portrait was in progress, Opie became alarmed for his success: he was distracted by a multitude of hints which friends who came in swarms dropped, regarding the expression, the posture, and the handling. Fox was amused with the variety of opinions, and kindly whispered to Opie, "don't mind what these people say—you must know better than they do."

The ladies who sat for their portraits he found more difficult to deal with than the great leader of the Whigs. There was at first a want of grace and softness in his female heads—he felt this early, and labored to amend it—but it is said, that he did not wholly succeed till his second marriage. "Opie," said one of his brethren, when he exhibited some female portraits soon after that event, "we never saw any thing like this in you before—this must be owing to your wife:" and it is likely that the compliment, though paid perhaps in jest, was nevertheless just. The habitual ruggedness of his personal manners yielded to the winning and graceful tact of Amelia Opie, and it is easy to believe that her presence might have the same influence upon his pencil. The words in which she vindicates her husband from the charge of speaking his mind coarsely, and a desire to appear a grand natural character, are well worth transcribing.

"Of all employments portrait painting is perhaps the most painful and trying to a man of pride and sensibility, and the most irritating to an irritable man. To hear beauties and merits in a portrait often stigmatized as deformities and blemishes—to have high lights taken for white spots, and dark effective shadows for the dirty appear-

ance of a snuff-taker:—to witness discontent in the by-standers, because the painting does not exhibit the sweet smile of the sitter, though it is certain that a smile on canvass looks like the grin of idiocy; while a laughing eye, if the artist attempts to copy it, as unavoidably assumes the disgusting resemblance of progressive intoxication. Sitters themselves—Mr. Opie rarely found troublesome; but *persons of worship*, as he called them, that is, persons of great consequence, either from talent, rank, or widely spreading connexions, are sometimes attended by others whose aim is to endeavor to please the great man or woman by flattery wholly at the expense of the poor artist; and to minister sweet food to the palate of the patron, regardless though it be wormwood to that of the painter. Hence arises an eulogy on the beauties and perfections of the person painted, and regrets that they are so inadequately rendered by the person painting; while frivolous objection succeeds to frivolous objection, and impossibilities are expected and required as if they were possibilities. I have too frequently witnessed this, and my temper and patience have often been on the point of deserting me, even when Mr. Opie's had not apparently undergone the slightest alteration—a strong proof that he possessed some of that self-command which is one of the requisites of good breeding."

He experienced no such difficulties in his historical compositions—the heroes or the beauties of other days had no friends to be fastidious about their merry eyes or their smiling lips, and he could exchange dark ringlets for tresses of gold, and distribute too glowing complexions according to his own will and pleasure. He had, however, an equally painful battle to sustain with the men of taste and virtue, whose heads were crammed with the remembrance of the principal works of the great masters of Italy—men who had ridden post-haste through the continent, and returned with the incurable belief that every thing old was excellent—every thing new poor and degenerate. Originality was looked upon as something strange and outre—to trust to the strength of nature was weakness—to work so that the spirit and effect could be justified by reference to Rembrandt or Raphael, was to possess true taste, and to be imbued with the spirit of the great masters.

Opie, it must be admitted wanted poetic power to enable him to rise to the first eminence as an historical painter—but he had a sense of propriety of action and vigor of character which these connoisseurs wanted nerve to feel, and which have stamped no light value on many of his historical productions.

Those which have caught public fancy most are the Murder of James the First of Scotland; the Presentation in the Temple; Jephthah's Vow; the Death of David Rizzio; Young Arthur taken Prisoner; Arthur with Hubert; Belisarius; Juliet in the Garden; and the Escape of Gil Blass and Musidora. Many others might be named, and many more praised; for he conceived without much delay, and executed with great readiness. He had no air-drawn visions of beauty before him which his pencil loved to follow; he sketched in his group, sought living nature to help him out with what was not in his mind's eye, and, bending his subject to his model rather than elevating the model to suit the subject, enslaved himself to the literal flesh and blood which he copied. "He painted what he saw," says West, "in the most masterly manner, and he varied little from it. He saw nature in one point more distinctly and forcibly than any painter that ever lived. The truth of color, as conveyed to the eye through the atmosphere, by which the distance of every object is ascertained, was never better expressed than by him. He distinctly represented local color in all its various tones and proportions whether in light or in shadow, with a perfect uniformity of imitation. Other painters frequently make two separate colors of objects in light and in shade,—Opie never. With him no color—whether white, black, primary, or compound—ever, in any situation, lost its respective hue."

His works were not the offspring of random fits of labor, after long indulgence in idleness; they were the well-considered progeny of his mind and hand—the fruit of daily toil, in which every hour had its allotted task. He sketched out a plan of weekly study, from which pleasure or persuasion seldom wiled him. "He was always in his painting-room," says Amelia Opie, "by half-past eight in winter, and by eight o'clock in summer; and there he

generally remained, closely engaged in painting, till half-past four in winter, and till five in summer. Nor did he ever allow himself to be idle when he had no pictures bespoken; and as he never let his execution rust for want of practice, he, in that case, either sketched out designs for historical or fancy pictures, or endeavored, by working on an unfinished picture of me, to improve himself by incessant practice in that difficult branch of art, female portraiture. Neither did he suffer his exertions to be paralyzed by neglect the most unexpected, and disappointment the most undeserved."

The world looks only at the brilliant result of an artist's labor. We see a magnificent work, filled with divine shapes and glowing with the freshest hues of heaven and earth, and the idea never darkens in our fancy that he who created this prodigy is in dread of want, and perhaps even now knows not how he is to be fed to-morrow. "Though he had a picture in the Exhibition of 1801, which was universally admired, and purchased as soon as beheld"—I quote once more the words of his widow—"he saw himself at the end of that year and the beginning of the next almost wholly without employment; and even my sanguine temper yielding to the trial, I began to fear that, small as our expenditure was, it must become still smaller. Not that I allowed myself to own that I desponded; on the contrary, I was forced to talk to him of hopes and to bid him look forward to brighter prospects, as his temper, naturally desponding, required all the support imaginable. But gloomy and painful indeed were those three alarming months; and I consider them as the severest trial I experienced during my married life. Even despondence did not make him indolent; he continued to paint regularly as usual, and, no doubt, by that means increased his ability to do justice to the torrent of business which soon afterward set in towards him, and never ceased to flow till the day of his death."

There is no doubt that Opie incurred a debt of gratitude to Wolcot for his frank and friendly encouragement, when he was a menial in his house in Cornwall, and for his anxious introduction of "the Cornish Wonder" to the novelty-gazers of London.

The poet often complained that the painter was ungrateful. He probably expected that when Opie had earned fame and name, he should still consider himself under the shadow of his patronage. I know not enough of the private history of the artist to decide, with certainty and exactness, in how far he was blameable for the coldness which took place between them, and anticipated the grave. The doctor was an odd and capricious man, who loved swearing better than satire, and united them both frequently to the injury of his best friends: it was no wonder therefore that Opie should shrink from his society, more especially if he still retained the airs of the master. Officious go-betweens carried to the artist the last satiric thing which the poet had uttered concerning him, and then returned to the satirist with the morose and surly observations of Opie. "What ails Wolcot at you?" said one of those persons—"once I thought he had been a friendly and kind-hearted man?" "Ay, ay," answered Opie, "in time you will know him." When the painter's works happened to be praised in Wolcot's presence, he always coupled very dexterously the present time with the past, and formed a back-ground to his fame with the humility and darkness of his early life. With him who gave the first cause of offence the odium of this estrangement must abide, and I have, I own, some fears that it appertains to Opie.

For the loss of this early friend, the infidelity of his wife, and the fickleness of popular opinion he sought a wise remedy—a woman worthy of his affection, who could sooth him in periods of depression, and, by her good sense and clear understanding, aid him in all his undertakings. He was thirty-seven years old, and that youthful fever which all feel was past and gone; he could now choose discreetly. The merits of the lady are widely known—not through the genius of her husband, but her own; and all who have read her works must feel that she was worthy of wearing the name of Opie. To her pen we owe the little that has been publicly told concerning the private life and modes of study of her husband; and though we wish to know him more familiarly, we are not insensible to the delicacy of the task which she undertook. What other colors,

save those that are rich and bright, could a wife use in drawing her husband's character? She expected, indeed, that an ampler memoir would be written by a bolder, and perhaps colder, hand; and might desire to leave to this biographer the ungentle task of adding the ruder touches and the darker shades. This has not been done; and from the garland which she hung over his bier, I must take a few more flowers. I shall endeavor to do this with a respectful hand.

Opie was no impatient laborer for wealth, who desired to snatch his gains before his colors were dry on the canvass: he studied much, wrought incessantly, and was ill to please. "During the nine years that I was his wife," says Mrs. Opie, "I never saw him satisfied with any one of his productions; and often, very often, have I seen him enter my sitting-room, and, throwing himself in an agony of despondence on the sofa exclaim, 'I am the most stupid of created beings, and I never, never shall be a painter as long as I live.' He used to study at Somerset House, when the pictures were hung up, with more persevering attention and thirst for improvement than was ever exhibited perhaps by the lowest student in the schools, and on his return I never heard him expatiate on his own excellences, but sorrowfully dwell on his own defects; while he often expressed to me his envy of certain powers in art which other painters were masters of, and which he feared he should never be able to obtain."

Thus quick to censure his own works, our painter was slow to commend those of his brethren. There is indeed a singular tardiness among artists in either praising or blaming one another: they seem to think that the whole world is waiting for their opinion, and that commendation will raise a brother above his level, and censure sink him below it. They deal out dark and diplomatic responses respecting each other's merits, and leave you to interpret their meaning. "Opie," says his wife, "was free from vanity—more particularly from that vanity which induces a man to believe that his wisdom is great. He was so slow to commend, and panegyric on the works of contemporary artists was so sparingly given by him, that it was natural for some persons to suppose him

actuated by the feelings of professional jealousy; but it was more generous, and I am fully convinced more *just*, to think this sluggishness to praise was merely the result of such a *high idea* of excellence in his art as made him not easily satisfied with efforts to obtain it; and surely he who was never led by vanity or conceit to be contented with his *own* works, could not be expected to show great indulgence to the works of others." I know not what standard of excellence was present to the fancy of Opie; but if a man is to withhold his approbation from all works which fail to equal the best of the golden days of art, he may shut his mouth for ever.

He was exposed, as all men of eminence are, to the attacks of the envious and the malevolent. A speculator in biography, having handled one man of genius with sharp and vulgar severity, singled out Opie for his second victim, and so little did he keep his infamous purpose a secret, that it reached the ear of the artist. Opie, having perused some of his adversary's compositions, saw that the man mistook the venom of the arrow for the vigor of the bow: he only smiled, and said, "If this is all he can do, he is welcome to say any thing of me he likes. I shall neither menace him nor bribe him into silence." "For his fame, *latterly*, at least," says Mrs. Opie, he was indebted to himself alone; by no puffs, no paragraphs, did he endeavor to obtain public notice; and I have heard him, with virtuous pride, declare that whether his reputation were great or small, it was self-derived, and he was indebted for it to no exertions save those of his own industry and talents. He might, like others, mistake sometimes weeds for flowers, and bring them home, and carefully preserve them as such; but the weeds were gathered by his own hands, and he had, at least, by his labor deserved that they should be valuable acquisitions."

His heart was with his art—other artists, as Northcote said, painted to live, but Opie lived to paint; and though he was dilatory about praising the works which his brethren produced with the brush, he was forward enough in admiring their attempts with the pen. "Whatever," said Mrs. Opie, "had a tendency to exalt painting and its professors in the eyes of the world,

was a source of gratification to him. He used often to expatiate on the great classical attainments of Mr. Fuseli, whose wit he admired, and whose conversation he delighted in: but I have often thought that one cause of the pleasure which he derived from mentioning that gentleman's attainments, was his conviction, that the learning of Mr. Fuseli was an honor to his profession, and tended to exalt it in the opinion of society." Nor was his pleasure less in reading the Poem on Art, by Mr. Shæ—a work which will be valued while knowledge, feeling, and elegance are in estimation.

An imaginary sum was floating incessantly before Opie's eye, which his pencil was to accumulate. That golden speculation at length achieved, he intended to retire from art—establish a gallery of good painting, and a well-stocked library; and with his wife by his side, and all cares for a well filled easel given to the winds, enjoy life like one who knew it was short. As he was frugal and temperate, his expenses were small; and as he was a quick workman, his gains were large. He was too proud to incur debts, and not so vain as to give expensive entertainments to those who would probably have paid them with sarcasm. He was one likely, therefore to achieve his wishes in gaining that desired sum, which was to come with healing on its wings to the spirit of the painter. But he did not, perhaps, reflect, that in retiring from his profession, an artist retires also from his station in society. An artist is like an instrument of music, which gives joy and gladness when skilfully touched, but is only looked upon as an idle encumbrance and a piece of wood when silent and out of tune.

Opie, having written a Memoir of Reynolds for Wolcott's edition of Pilkington's Dictionary of Painters, and delivered lectures on art at the British Institution, aspired to the Professorship of Painting in the Royal Academy, when Barry was ejected. In the Memoir of Sir Joshua, he had exhibited knowledge of his subject, a just perception of character, and no small infirmity of taste; in his lectures at the Institution he had been considered confused, abrupt, and unmethodical; but now, with confirmed taste and an increase of knowledge, he offered himself a candidate for the professorship. He was unexpectedly

opposed by Fu-eli. When that eminent scholar was named, he relinquished his pretensions—but it is no small proof of the vanity of Opie, that he declared as he withdrew from the contest, he would have yielded to no one save Henry Fuseli. When the Professor was made Keeper he renewed his claim, and was instantly elected.

Of his Four Lectures, on Design, Invention, Chiaro-Scurro, and Coloring, some account must be given, and a short one will suffice. Few who read them will concur in the praise bestowed on his discourses, at the Institution, by the late excellent Bi-hop of Durham, "You were known before as a great painter, Mr. Opie, you will now be known as a great writer also." They are clear and sensible enough, but deficient in original grasp of mind—there are few vigorous sallies, or poetical flights, or passages of deep discernment and delicate discrimination. He wants imagination to raise him to the height of his "great argument," and his powers of illustration are neither vivid nor various. Yet it cannot be denied that many valuable reflections are scattered over these four lectures. Let all those youths who desire to become artists read the following admirable passage thrice over before they wet the brush.

"Impressed as I am at the present moment with a full conviction of the difficulties attendant on the practice of painting, I cannot but feel it also my duty to caution every one who hears me, against entering into it from improper motives, and with inadequate views of the subject; as they will thereby only run a risk of entailing misery and disgrace on themselves and their connexions during the rest of their lives. Should any student therefore happen to be present who has taken up the art on the supposition of finding it an easy and amusing employment—any one who has been sent into the Academy by his friends, in the idea that he may cheaply acquire an honorable and profitable profession—any one who has mistaken a petty kind of imitative monkey talent for genius—any one who hopes by it to get rid of what he thinks a more vulgar or disagreeable situation, to escape confinement at the counter, or the desk—any one urged merely by vanity or interest—or, in short, impelled by any con-

sideration but a real and unconquerable passion for excellence; let him drop it at once, and avoid these walls and every thing connected with them, as he would the pestilence; for if he have not this unquenchable liking, in addition to all the requisites above enumerated, he may pine in indigence, or skulk through life as a hackney likeness-taker, a copier, a drawing-master, or pattern drawer to young ladies, or he may turn picture cleaner and help Time to destroy excellences which he cannot rival—but he must never hope to be, in the proper sense of the word, a painter. Strait is the gate and narrow is the way that leads to excellence, and few there be that find it."

His notion of the ideal or the beautiful is natural and just. "I will not undertake," he says, "the perilous task of defining the word beauty: but I have no hesitation in asserting, that when beauty is said to be the proper end of art, it must not be understood as confining the choice to one set of objects, or as breaking down the boundaries and destroying the natural classes, orders, and divisions of things, but as meaning the perfection of each subject in its other associated and consistent attributes. In this qualified and; I will venture to say, proper acceptance of the word in regard to art, it may be applied to nearly all things most excellent in their different ways. Thus we have various modes of beauty in the statues of the Venus, the Juno, the Niobe, the Antinons, and the Apollo; and thus we may speak, without exciting a confusion of ideas, of a beautiful peasant as well as of a beautiful princess, of a beautiful child, or of a beautiful old man; of a beautiful cottage, a beautiful church, a beautiful palace, or even of a beautiful ruin. The discovery or conception of this great and perfect idea of things, of nature in its purest and most essential form, unimpaired by disease, un mutilated by accident, and unsophisticated by local habits and temporary fashions, and exemplification of it in practice by getting above individual imitation, rising from the species to the genus, and uniting in every subject all the perfection of which it is capable in its kind, is the highest and ultimate exertion of human genius."

In his Lecture upon Invention, also, there is much to commend. "Unfortunately," he says, "this most inestimable quality, in which genius is thought more

particularly to consist, is of all human faculties the least subject to reason or rule, being derived from heaven alone, according to some; attributed by others to organization; by a third class, to industry; by a fourth, to circumstances; by a fifth, to the influence of the stars; and in the general opinion, the gift of nature only. But though few teach us how to improve it, and still fewer how to obtain it, all agree that nothing can be done without it. Destitute of invention, a poet is but a plagiarist, and a painter but a copier of others. But however true it may be, that invention cannot be reduced to rule and taught by regular process, it must necessarily, like every other effect, have an adequate cause. It cannot be by chance that excellence is produced with certainty and constancy; and however remote and obscure its origin, thus much is certain, that observation must precede invention, and a mass of materials must be collected before we can combine them. He, therefore, who wishes to be a painter must overlook no kind of knowledge. He must range deserts and mountains for images, picture upon his mind every tree of the forest and flower of the valley, observe the crags of the rock and the pinnacles of the palace, follow the windings of the rivulet, and watch the changes of the clouds: in short, all nature, savage or civilized, animate or inanimate, the plants of the garden, the animals of the wood, the minerals of the earth, and the motions of the sky, must undergo his examination. Whatever is great, whatever is beautiful, whatever is interesting, and whatever is dreadful must be familiar to his imagination, and concur to store his mind with an inexhaustible variety of ideas ready for association on every possible occasion, to embellish sentiment and give effect to truth. It is moreover absolutely necessary that then the epitome of all—his principal subject and judge—should become a particular object of his invention: he must be acquainted with all that is characteristic and beautiful, both in regard to his mental and bodily endowments; must study their analogies, and learn how far moral and physical excellence are connected and dependent one on the other. He must farther observe the power of the passions in all their combinations, and trace their changes as modified

by constitution, or by the accidental influences of climate or custom, from the sprightliness of infancy to the despondency of decrepitude; he must be familiar with all the modes of life, and, above all, endeavor to discriminate the essential from the accidental, to divest himself of the prejudices of his own age and country, and, disregarding temporary fashions and local taste, learn to see nature and beauty in the abstract, and rise to general and transcendental truth, which will always be the same."

Next to the contemplation of nature he urges the study of poetry, which abounds in the noblest pictures and most splendid descriptions, unites the present with the past, and anticipates the future. He feels, however, that many of the sublimest and most touching passages in poetry cannot be embodied in painting; and he also feels that the multitude, with many men of taste among them, are slow in acknowledging the merits which belong to the imagination, and turn coldly from its most magnificent efforts. There is, indeed, a certain coarseness of feeling as to works of elegance and fancy which pervades this country; and it extends to the labors of the pen as well as to those of the pencil and the chisel. In other nations, the presence of such things inspires a kind of awe: with us a statue is occasionally a mark to cast stones at, and the mob at best bestow their shilling to stare at what they cannot enjoy. "So habituated," says Opie, "are the people of this country to the sight of portraiture only, that they can scarcely as yet consider painting in any other light; they will hardly admire a landscape that is not a view of a particular place, nor a history unless composed of likenesses of the persons represented, and are apt to be staggered, confounded, and wholly unprepared to follow such vigorous flights of imagination as would—as will be felt and applauded with enthusiasm in a more advanced and liberal stage of criticism. In our exhibitions, which often display extraordinary powers wasted on worthless subjects, one's ear is pained, one's very soul is rent with hearing crowd after crowd sweeping round, and instead of discussing the merits of the different works on view, as to conception, composition, and execution, all reiterating the same dull and

‘tasteless questions, “*who is that?*” and “*is it like?*” Passages such as these would reflect on any professor the Academy ever possessed.

On the delivery of his first lecture in the Academy Opie was complimented by his brethren: he was escorted home by Sir William Beechy, and appeared to his wife in a flush of joy. Next morning he said he had passed a ruthless night, for he was so *elated* that he could not sleep.

When Opie had finished his course of lectures, Mr. Prince Hoare requested an article for his periodical paper called *The Artist*. “I am tired”—such was his answer—“I am tired of writing. I shall be a gentleman during the spring months, keep a horse, and ride out every morning.” This vision of happiness, such as it was, he lived not to realize. He was attacked by a slow and a consuming illness, which baffled the knowledge of five skilful doctors: Pitcairn and Baillie were of the number. They were unable to cure or even to comprehend it. When it was known that he was seriously ill, his friends, and they were numerous and respectable, came round him with affectionate solicitude. Among those that he loved most was Henry Thompson, and to him he confided the finishing the robes of the Duke of Gloucester’s portrait. On Saturday, when the pictures were to be delivered for the exhibition at Somerset House, the picture of the Royal Duke was placed at the foot of his bed. A fit of delirium had subsided: he lifted his head, and said, “There is not color enough on the back ground.” More

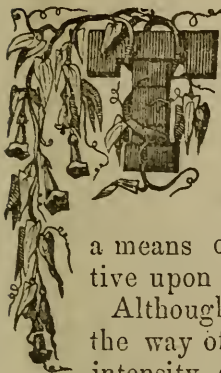
color was added: Opie looked at it with great satisfaction, and said with a smile, “Thompson, it will do now—it will do now—it will do now; if you could not do it, nobody could.” The delirium returned, and took its hue from the picture he had just looked at. He imagined himself employed in his favorite pursuit, and continued painting in idea till death interposed, on Thursday, the 9th of April, 1807. On dissection, the lower part of the spinal marrow and its investing membrane were found slightly inflamed, and the brain surcharged with blood. On Monday, April 20, he was interred in St. Paul’s Cathedral, near Sir Joshua Reynolds.

In person Opie looked like an inspired peasant: even in his most courtly days there was a country air about him, and he was abrupt in his language and careless in his dress, without being conscious of either. His looks savoured of melancholy; some have said of moroseness: the portrait which he has left of himself shows a noble forehead and an intellectual eye. There are few who cannot feel his talents, and all must admire his fortitude. He came coarse and uneducated from the country into the polished circles of London; was caressed, invited, praised, and patronised for one little year or so, and then the giddy tide of fashion receded; but he was not left a wreck. He had that strength of mind which triumphs over despair. He estimated the patronage of fickle ignorance at what it was worth, and lived to invest his name with a brighter as well as steadier halo than that of fashionable wonder.

DEUTOCHLORIDE OF MERCURY.

NIMES, Sept. 17th, 1853.

MR. EDITOR DE LA LUMIERE:



THE number of Saturday 6th, of August, makes mention of a very important communication made by M. Lespiault, and relative to the use of the deutochloride of mercury, as a means of strengthening the negative upon glass.

Although up to that time, I was in the way of obtaining negatives with intensity enough not to need being strengthened, I thought it useful to study the discovery of M. Lespiault.

Thus it was that in concert with M. Laurent, a distinguished amateur of this city, we made some experiments, all of which succeeded in an admirable manner; some very feeble negatives on glass, obtained by this process extraordinary vigor. This result encouraged us, and we wished to try upon some clichés upon paper.

We took then a very feeble negative, dim and yellow in the light. This proof had already been fixed by the hyposulphite of soda. Nevertheless, we put it in a bath of bichloride of mercury, 10 to 100; and after a moment, the proof from being dim and confused, became perfectly transparent in the lights; the wrong side itself took a whole tint, the least appearance of dimness had disappeared, and the proof after having taken an ashey grey tone, ended by disappearing almost entirely; in this state it appeared lost. We washed it then in many waters, and after having deposited it in a wash basin, we poured upon it a solution of hyposulphite, 10 to 100. Immediately the image reappeared, and acquired an incredible vigor. We made this experiment upon many proofs and all gave us a result as satisfactory. We think that more or less of the greatness of the intensity which is produced depends much of the time upon the position, for after the few experiments we have made, we have remarked that the proof did not gain in vigor by the prolongation of the time in the hyposulphite bath; however, it would appear

probable that to obtain more vigor it would be necessary not to leave the proof too long under the action of the deutochloride of mercury.

It is, therefore, very evident to me now, by what has been done, that the best means of strengthening the negative, whether upon glass, or upon paper is the use of the bichloride of mercury, combining itself with the hyposulphite of soda.

Confident in these many trials, the thought then comes to us of applying these processes also to the *positive proofs upon paper*; this might avoid that loss of proofs so often repeated when operating on a large scale. We took then a positive having been fixed, and submitted it to various baths; but, to our great astonishment, obtained a contrary result: the proof instead of being strengthened, lost greatly. This result is not less advantageous, for it does not remedy the positives which are weakly developed, it preserves those which are too strong. We made then an experiment upon the proofs which had been developed too much, in a word, completely black, run together and without detail. After these various preparations, we obtained some very fine proofs: the shades were clear, and all the details were indicated by a tone a little dark brown, simply by replacing the black tone.

It will be necessary to make a great series of experiments, in order to give a complete account of the different phenomena which present themselves, and of the stability of the results. This is why, I beg you, Mr. Editor, to present the various experiments to the knowledge of your readers, persuaded that skillful men who are occupied with photography, not only will perfect them, but discover yet new phenomena useful to the growing art.

Receive, &c.

DISDERI.

IMPORTANT IMPROVEMENT IN PHOTOGRAPHY UPON COLLODION.

Bath of Silver Schoer.—Collodion Disderi.

Heretofore, the pyro-gallic acid has had the superiority in the production of nega-

tives upon collodion; the use of the gallic acid has been renounced because of its slowness in making the image appear—a slowness which contributes to the weakening of the collodion, and made it separate from the glass. The pyro-gallic acid was infinitely more expeditious, but its promptitude even became a defect: the fine proofs were formed at once and the least delay in the washing with the water dimmed the lights. The water itself used for dissolving was often the cause of failure and certainly those persons who use distilled in place of the river water, which is often very good, will have failed by reason of the bad quality of this distilled water, arising from the condensation of the vapor having passed by the machine and containing an imperceptibly greasy principle.

Besides the pyro-gallic acid must be dissolved at the moment of using it—the solution weakens from day to day; for my part, the thought of extracting this substance from the flask where it is incrustated was very disagreeable to me, and I felt very happy in having it all prepared to hand.

It is with a view of avoiding this trouble that some reductive liquids are being prepared which will keep indefinitely. The first which has appeared is *very simple, some pyro-gallic acid to which is added a crude pyro-ligneous acid instead of the crystalizable acetic acid*. A new preparation of it is being made, quite as good, which will be much cheaper.

Things being so when I had occasion to try Schoer's bath of silver, of which the composition is such that we employ simply *the concentrated solution of gallic acid in river water, which loses nothing of its force by age*, and what is extraordinary, the negative image appears instantly, that is to say, yet more rapidly than with the pyro-gallic acid, *without ever being dimmed by the gallic acid remaining upon the proof*: the negatives are of a brown tone of an extreme fineness which has appeared to me to equal in some sort the negatives upon the albuminated glass. If the negative is feeble, it can be strengthened by replacing the gallic acid, used at first alone by some new gallic acid with some nitrate of silver added; the negatives strengthened thus with time, without dimming the lights.

The use of this bath has appeared to me to be rather a cause of sensibility than of delay. For all at once when I have diminished the duration of the exposition with the intention of obtaining positives I have good negatives destroyed. For this last use, the Schoer bath has not succeeded with me; the lights were not of an absolute transparency, the first condition necessary for the direct positives upon glass; but the Schoer bath, used with the sulphate of iron, gives the whole with an extraordinary clearness, and at the same time with a charming sweetness. It has the tone of milk or of porcelain, and the black is at the same time irreproachable.

M. Schoer has told me that his bath permits the washing of collodion with distilled water without too much diminishing its sensibility, and therefore allows the possibility of taking proofs anywhere—he claims also that it gives to the albumen an unusual sensibility. I have not yet verified these two assertions; but thus far I have always found all the facts announced by this inventor very exact, I have not contradicted them by any doubt, and I shall be able some day to pronounce myself upon the albumen.

The Schoer bath has besides some other advantages: so far from having to hurry when the plate has become susceptible, it *can be put to drain, and this is even a good precaution*.

I have made all the trials of the Schoer bath with the collodion of Disdéri; I know not to which ingredient to attribute the beauty of the result; but believe that both have contributed equally. By the experiments made, the collodion Disdéri has shown an extreme sensibility and has given me positives upon glass of an exquisite beauty. With regard to the light positives, which are of an incomparable fineness, I have operated *ten times as quickly as with the plate*, and in the case of the intensely white positives, *five times as quickly as with the plate*.

The Disdéri collodion has nevertheless appeared to me feeble of cohesion; it requires the use of a hyposulphate very much diluted with water and the liquid must be very gently poured upon the middle of the proof. I have been forced in order to employ it upon little plates, to strengthen it by some thick neutral collodion. In refer-

ence to the great plates, by leaving the collodion to rest a little before pouring off the surplus this inconvenience will be lessened certainly ; besides, I do not think that this defect can be inherent in the preparation of collodion itself. The flask which I used showed to a feeble degree what I call the humid principle, which results from an alteration of the elements of the collodion, and which may be manifested in *the best prepared* collodions, under the influence of an elevated temperature ; there have been, this summer, some extraordinary and most vexatious examples of this unfortunate transformation, of which the first cause is yet a mystery.

At present, the collodion with a base of bromide, are in great favor ; the Desideri collodion has appeared to me, however, to be based with iodide (iodure) ; and if the bromide goes more quickly, it will be very beautiful. I was one of the first to study and describe the collodions with a base of bromide ; it can be reasonably hoped to obtain by this substitution more steadiness, for the iodine is the most unstable of bodies. I persist always in the study of *bromide of zinc* which I prepare myself. I shall finish this article by the expose of a singular mistake, which has just appeared to me, and which proves in a great degree, the value of manual skill. Having prepared some

bromide of alcoholic zinc, in prolonging the ebullition of the alcohol with the design of having it more perfect, I obtained a collodion showing after having received its susceptibility, a magnificent bluish color ; but I have never been able to obtain a proof by it ; I have concluded from this that an ether was formed with a base of bromine, which was the cause of this insensibility. I then thought that the preparation when cold would give a result entirely different, so much the more that I had already obtained some collodions of the bromide of zinc which were imperfect rather by excess of sensibility, when I prepared the bromide cold ; in fine I obtained last night a collodion of this kind, which gave me in a few seconds, proofs very black by the light of a candle.

An analagous phenomenon presents itself with the iodine : in mixing together a neutral collodion with iodine dissolved in alcohol and some ammonia, a collodion *was obtained taking a fine opaline tint, which does not give any proof in a dark room.*

These facts, connected with what has happened to me in reference to a collodion with a base of chloride, makes me believe that the collodions with this base would easily become the most susceptible and most stable on properly preparing them.

M. A. GAUDIN.

From Notes and Queries.

ALBUMENIZED PAPER.



IF this subject be not already exhausted, the following account of my method of preparing the material in question, which differs in some few important particulars from any I have seen published, may be of interest to some of my brother operators.

I have, after a very considerable number of experiments, succeeded

in producing the *very highly* varnished appearance, so conspicuous in some of the foreign proofs ; and although I cannot say I admire it in general, more especially as regards landscapes, yet it is something very effective for portraits, giving a depth of tone to the shadows, and a roundness to the flesh, which is very striking. Moreover, a photographer may just as well be acquainted with every kind of manipulation connected with the art.

Having but a very moderate amount of

spare time, and that at uncertain intervals, to devote to this seductive pursuit, I am always a great stickler for *economy of time* in all the processes, as well as for economy of material, the former with me having, perhaps, a shade more influence than the latter.

As in all other processes, I find that the *kind of paper* made use of has a most important bearing upon the result. That which I find the best is of French manufacture, known as Canson Freres' (both the thin and thick sorts,) probably in consequence of their being sized with starch. The thin sort (the same as is generally used for waxed-paper negatives) takes the highest polish, but more readily embrowns after being rendered sensitive, and the lights are not ever quite so white as when the positive paper is used.

In order to save both time and labor, I prepare my papers in the *largest* sizes that circumstances will admit of, as it takes little or no more time to prepare and render sensitive a large sheet than a small one; and as I always apply the silver solution by means of the glass rod, I find that a half-sheet of Canson's paper (being seventeen inches by eleven inches the half-sheet) is the best size to operate on. If the whole sheet is used, it requires *more* than double the quantity of solution to ensure its being properly covered; which additional quantity is simply so much waste.

A most convenient holder for the paper whilst being operated upon, is one suggested by Mr. Horne of Newgate Street, and consists of a piece of half-inch Quebec yellow pine plank (a soft kind of deal), eleven by seventeen inches, screwed to a somewhat larger piece of the same kind, but with the grain of the wood at right angles to the upper piece, in order to preserve a perfectly flat surface. On to the upper piece is glued a covering of japanned flannel, such as is used for covering tables, taking care to select for the purpose that which has no raised pattern, the imitation of rosewood or mahogany being unexceptionable on that account. The paper can be readily secured to the arrangement alluded to by means of a couple of pins, one at each of two opposite angles, the wood being sufficiently soft to admit of their ready penetration.

To prepare the Albumen.—Take the

white of *one* egg; this dissolve in one ounce of distilled water, two grains of chloride of sodium (common salt,) and two grains of *grape* sugar; mix with the egg, whip the whole to a froth, and allow it to stand until it again liquifies. The object of this operation is to thoroughly incorporate the ingredients, and render the whole as homogeneous as possible.

A variety in the resulting tone is produced by using ten grains of sugar of milk instead of the grape sugar.

The albumen mixture is then laid on to the paper by means of a flat camel's hair brush, about three inches broad, the mixture being first poured into a cheese plate, or other flat vessel, and all froth and bubbles carefully removed from the surface. Four longitudinal strokes with such a brush, if properly done, will cover the whole half-sheet of paper with an even thin film; but in case there are any lines formed, the brush may be passed very lightly over it again in a direction at right angles to the preceding. The papers should then be allowed to remain on a perfectly level surface until nearly dry, when they may be suspended for a few minutes before the fire, to complete the operation. In this condition the glass is but moderate, and as is generally used; but if, after the first drying before the fire, the papers are again subjected to precisely the same process, the negative paper will shine like polished glass. That is coated again with the albumenizing mixture, and dried as before.

One egg, with the ounce of water, &c., is enough to cover five half-sheets with two layers, or five whole sheets with one.

I rarely iron my papers, I do not find any advantage therein, because the moment the silver solution is applied the albumen becomes coagulated, and I cannot discover the slightest difference in the final result, except that when the papers are ironed I sometimes find flaws and spots occur from some carelessness in the ironing process.

If the albumenized paper is intended to be kept for any *long* time before use, the ironing may be useful as a protection against moisture, provided the *iron be sufficiently hot*; but the temperature ought to be considerable.

To render the paper sensitive, I use a hundred-grain solution of nitrate of silver, of which forty-five minims will exactly

cover the sheet of seventeen inches, if laid on with the glass rod. A weaker solution will do, but with the above splendid tints may be produced. As to the ammonio-nitrate of silver, I have totally abandoned its use, and, after many careful experiments, I am satisfied that its extra sensitiveness is a delusion, while the rapid tendency of paper prepared with it to spoil is increased tenfold.

The fixing of course, modifies considerably the tone of the proof, but almost any desired shade may be attained by

following the plan of Mr. F. M. Lyte, published in "N. & Q.," provided the negative is sufficiently intense to admit of a considerable degree of over-printing.

It is a fact which appears to be entirely overlooked by many operators, that the *intensity* of the negative is the chief agent in conducting to black tones in the positive proof; and it is almost impossible to produce them if the negative is poor and weak: and the same observation applies to a negative that has been *over-exposed*.

GEO. SHADBOLT.

NEW PROCESS FOR POSITIVE PROOFS.

I have tried a method of preparing my paper for positive proofs, which, as I have not seen it mentioned as employed by others, and the results appear to me very satisfactory, I am induced to communicate to you, and to accompany by some specimens, which will enable you to judge of the amount of success.

I use a glass cylinder, with air-pump attached, such as that described by Mr. Stewart as employed by him for iodizing his paper. I put in this the salt solution, and that I use is thus composed: 2 drachms of sugar of milk, dissolved in 20 ounces of water, adding—

Chloride of barium	15 grs.
Chloride of Sodium	15 grs.
Chloride of Ammonium	15 grs.

In this I plunge several sheets of paper rolled into a coil (taking care that they are covered by the solution,) and exhaust the air. I leave them thus for a few minutes, then take them out and hang them up to dry; or as the sheets are rather difficult to pin, from the paper giving way, spread them on a frame, across which any common kind of coarse muslin or tarlatan, such as that I inclose, is stretched.¶

I excite with ammonio-nitrate of silver, 20 grains to 1 ounce of water, applied with a flat brush.

I fix in a bath of plain hypo. of the

strength of one-sixth. The bath in which the inclosed specimens were fixed has been in use for some little time, and therefore has acquired chloride of silver.

I previously prepared my paper by *brushing* it with the same salt solution, and the difference of effect produced may be seen by comparing a proof so obtained, which I inclose, with the others. This latter is of rather a reddish-brown, and not very agreeable tint. I have enclosed the proofs as printed on paper of Whatman, Turner, and Canson Freres, so as to show the effect in each case. The advantages which the mode I have detailed possess are, I think, these:

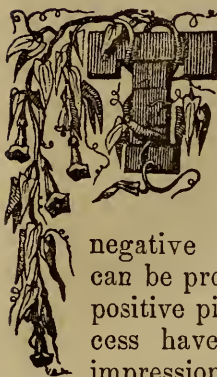
Greater sensitiveness in the paper,
A good black tint, and
Greater freedom from spots and blemishes all very material merits. C. E. F.

[Our Correspondent has forwarded five specimens, four of which are certainly very satisfactory; the fifth is the one prepared by brushing.]

Cement for Glass Bath.—The best I have tried is Canada balsam. My baths I have had in use five years, and have used them for exciting, developing hypo. and cyanide, and they are as good as when first used.

NOXID.

AMPHITYPE.



THE last process we have to describe in this portion of the work, is one recently made public by Sir John Herschel, and to which he has given the above name from the fact that both negative and positive photographs can be produced by one process. The positive pictures obtained by the process have a perfect resemblance to impressions of engravings with common printer's ink. The process, although not yet fully carried out, promises to be of vast utility, for which reason we deem it better to subjoin it in the words of its discoverer.*

"Paper proper for producing an amphitype picture may be prepared either with the ferro-tartrate or the ferro-citrate of the protoxide or the peroxide of mercury, or of the protoxide of lead, by using creams of these salts, or by successive applications of the nitrates of the respective oxides, singly or in mixture, to the paper, alternating with solutions of the ammonio-tartrate or the ammonio-citrate of iron, the latter solutions being last applied, and in more or less excess. I purposely avoid stating proportions, as I have not yet been able to fix upon any which certainly succeed. Paper so prepared and dried takes a negative picture, in a time varying from half an hour to five or six hours, according to the intensity of the light; and the impression produced varies in apparent force from a faint and hardly perceptible picture, to one of the highest conceivable fulness and richness both of tint and detail, the color in this case being of a superb velvety brown. This extreme richness of effect is not produced except lead be present, either in the ingredients used, or *in the paper itself*. It is not, as I originally supposed, due to the presence of free tartaric acid. They fade in the dark, though with very different degrees of rapidity, some (especially if free tartaric or citric acid be present) in a few days, while others

remain for weeks unimpaired, and require whole years for their total obliteration. But though entirely faded out in appearance, the picture is only rendered dormant, and may be restored, changing its character from negative to positive, and its color from brown to black (in the shadows) by the following process:—A bath being prepared by pouring a small quantity of water, and letting the subnitrated precipitates subside, the picture must be immersed in it (carefully and repeatedly clearing off all air bubbles,) and allowed to remain till the picture (if any where visible) is entirely destroyed; or if faded, till it is judged sufficient from previous experience; a term which is often marked by the appearance of a feeble positive picture of a bright yellow hue, on the pale yellow ground of the paper. A long time (several weeks) is often required for this, but heat accelerates the action, and it is often complete in a few hours. In this state the picture is to be very thoroughly raised and soaked in pure warm water, and then dried. It is then to be well ironed with a smooth iron, heated so as barely not to injure the paper, placing it, for better security against scorching, between smooth clean papers. If then the process have been successful, a perfectly black positive picture is at once developed. At first it most commonly happens that the whole picture is sooty or dingy to such a degree that it is condemned as spoiled, on keeping it between the leaves of a book, especially in a moist atmosphere, by extremely slow degrees this dinginess disappears, and the picture disengages itself with continually increasing sharpness and clearness, and acquires the exact effect of a copperplate engraving on a paper more or less tinted with a pale yellow. I ought to observe, that the best and most uniform from specimens which I have procured have been on paper previously washed with certain preparations of uric acid, which is a very remarkable and powerful photographic element. The intensity of the original negative picture is no criterion of what may be expected in the positive. It is from the production, by one and the action of the light, of either a positive or

* Read before the British Association, Sept. 31, 1844.

a negative picture according to the subsequent manipulations, that I have designated the process, thus generally sketched out by the term *amphitype*,—a name suggested by Mr. Talbot, to whom I communicated this singular result; and to this process or class of processes (which I cannot doubt when pursued will lead to some very beautiful results) I propose to restrict the name in question, though it applies even more appropriately to the following exceedingly curious and remarkable one, in which silver is concerned. At the last meeting I announced a mode of producing, by means of a solution of silver, in conjunction with ferro-tartaric acid a dormant picture brought out into a forcible negative impression by the breath or moist air. The solution then described, and which had, at that time, been prepared some weeks, I may here incidentally remark, has retained its limpidity and photogenic properties quite unimpaired during the whole year since elapsed, and is now as sensitive as ever,—a property of no small value. Now, when a picture (for example an impression from an engraving) is taken on paper washed with this solution, it shows no sign of a picture on its back, whether that on its face be developed or not; but if, while the actinic influence is still fresh upon the

face (*i. e.* as soon as it is removed from the light), *the back* be exposed for a very few seconds to the sunshine, and then removed to a gloomy place, *a positive picture, the exact complement of the negative one on the other side*, though wanting of course in sharpness if the paper be thick, *slowly and gradually makes its appearance* there, and in half an hour or an hour acquires a considerable intensity. I ought to mention that the 'ferro-tartaric acid' in question is prepared by precipitating the ferro-tartrate of ammonia (ammonio-tartrate of iron) by acetate of lead, and decomposing the precipitate by dilute sulphuric acid.

“When lead is used in the preparation of Amphitype paper, the parts on which the light has acted are found to be in a very high degree *rendered waterproof*.”

In the preceding pages we have attempted to furnish the reader with the most remarkable and the most interesting photographic processes as applied to paper. We have purposely omitted a few, for the reason that they were but modifications of other processes, and their use was attended with no practical advantage. The full details respecting daguerreotype, thermography, &c., will be found in the second part of this manual.

FAIR OF THE FRANKLIN INSTITUTE.

Philadelphia, Nov. 20th, 1853.

MR. SNELLING—DEAR SIR:—When I saw you in New York I promised to give you some idea of what was passing amongst the Fraternity here.

The subject of conversation at present is the Franklin Institute. I suppose you are aware the first *premium*, a *silver medal*, was awarded to me, (it being the only premium awarded for daguerreotypes) which has given great dissatisfaction to some. Amongst the most prominent of whom is M****, who is out in a card accusing the judges of favoritism and partiality, and

insinuating that our success was owing to secret influence, but all this we pass without comment, as very few of the judges are known to me even now.

It is true we are apt to look upon our own productions with partiality, particularly when they have cost us much labor and thought. But when so many of the visitors to the exhibition—amongst whom were some of our best artists—pronounced my pictures far beyond competition, I felt proud of the result of my labor, and their award was more to me than the medal of the Institute.

The exhibitors were Root, McClees & Germon, Weeks, McKerron, Ising, Phillips, Marston, Hinson, and I am sorry to say, a couple of the 25 cent fraternity.

The pictures were mostly of the smaller sizes. Root, had one double whole. I had four double whole of the largest size, which were soft clear and well defined; one of a lady with her reflection in a toilet mirror, is considered unsurpassed. McClees & Germon had none larger than whole size, which the judges considered no advancement over those of former exhibitions; the only improvement was in the making of large pictures.

The remark of my opponents that, not quality was rewarded, I consider a poor excuse, as they should know that to make a large size picture perfect, requires more skill and nicer management than those of small dimension; but we will excuse them as they never made one.

McClees & Germon received a premium for their colored talbotypes and crystalotypes; their display in this line was large, and contained many pictures of merit. Mr. Weeks also had some paper pictures made from collodion negatives, and from the short time he has been engaged in this branch he has made rapid progress; his pictures as they came from the negative

untouched by the artist, were clear and well defined, the detail well brought out; he received a first premium. In the point of coloring talbotypes, there was one on exhibition that in my mind distanced all; it was by Spicler, a portrait of a gentleman; there was a freedom of handling, and a brilliancy of coloring that was really beautiful.

There was also a frame of colored talbotypes by Mr. Cooper, and one by Mrs. Gent.

I believe I have given you the main features of the exhibition in the daguerreotype way. Many of the contributors, I presume, placed their pictures there, more as a card than to enter into competition, as their collections were made up mostly of small pictures.

There was one point which had been particularly attended to by Mr. Phillips, and the most essential of all in the art, I allude to the cleaning of the plate, in justice to him, I must say that I have never seen plates in a finer condition, than some in his collection. Many of the older ones in the profession might take a lesson from him.

Yours truly,

F. D. B. RICHARDS,
179 Chesnut st., Phila.

PLATE VICE; OR BUFFER.—An instrument invented by the Messrs. Lewis for holding the plate while being buffed: *a*, FIG. 92 is the platform containing the groove *d* which secures the different size beds; *c* the cam under which the plate is inserted and fastened, by pressing the lever *f* downward. The force of the pressure is regulated by the screw *g*.

PLATINUM.—This rare and valuable metal occurs native in Peru, Brazil and other parts of South America, in combination with gold, silver, copper, iron,

lead, &c. It is procured in the form of round or flattened grains, of a white color, mixed with sand and other alluvial deposits. Pure platinum is a soft metal, and an imperfect conductor of caloric; it has a white silver like appearance; but less malleable than either silver or gold. Its density is greater than other metals, being 21.5; its atomic weight is 96; it does not fuse at the highest temperature of a Smith's forge, but may be welded like iron when heated to a high temperature.—SEE PLATINOTYPE.

GOSSIP.

We are again at the close of another (the sixth) volume of the *Photographic Art-Journal*. Three years have we presented it to you most kind reader in the present form, and before entering upon a new volume permit us to wish you all a very happy New Year, and an increase in your customers and profits.

The progressive spirit of the age, and the demands of the *Photographic art*, which is about one of the most progressive branches of industry we know of, requires that we should change our general features and present ourselves, with the commencement of 1854, in an entire new form. The necessity of this change will be perceived upon giving the subject a moments thought. Photography is now assuming that position among the arts, in which it has been our aim, as well as that of many others, to place it, consequently, in order to cause it to be properly appreciated by men of taste and the public generally, a more popular method must be resorted to in Journalism than a periodical purely photographic. We must have something not only useful to the daguerrean and photographic artist, but pleasing and acceptable to the general reader.

An illustrated Journal, such as we shall hereafter make ours, is preremptorily called for to effect this desideratum. We shall not therefore confine ourselves, in our future issues, wholly to the *Photographic art*, but give so much of general Fine art matter as will tend to elevate the tastes not only of photographers but the public also, interspersing our pages with sufficient light reading, and biographical and historical sketches to relieve the monotony of a too close study of art.

We consider it barely necessary to make the announcement here, as our January

number will follow this issue so closely, that it can better speak for itself than we can for it. We have for this reason also concluded to insert our remarks upon the "*Daguerreotypes at the World's Fair*" we are now preparing in the next number, but we will here take occasion to say that individually and collectively it is the finest collection of daguerreotypes ever exhibited, at any time, to the public, and we are at a loss to conceive how any one professing so much critical knowledge as the writer could have written the article in one of our former numbers. It is true, it was in some respects a fair criticism, but on the whole it was considerably lame.

The decision in regard to the ANTHONY PRIZE PITCHER will also be found in our January issue. We were much disappointed, both in the quality and style of daguerreotypes sent in for competition. We were in hopes, from what we heard previous to the time appointed for the decision that considerable effort would be made to exhibit the taste and skill of our artists in composition, but with the exception of two all were simple single portraits. One of these will be crystalotyped for our January number. Mr. Gurney of New York was the successful candidate for the pitcher, and Mr. S. Root, of the same place, for the goblets. As there has been considerable feeling excited on account of the decision, and as the regret we have predicted on the part of those who did not contribute is pretty general, another prize will undoubtedly be offered, when we most sincerely hope that more interest will be felt for the result, and a more lively competition ensue.

— Mr. C. C. Harrison is now engaged on an entirely new photographic instru-

ment for copying purposes which he promises us will fill a void long felt by our artists.

—B. H.—The long agony is over—he has fought the good fight, finished his faith, and in the struggle has—been conquered. Fifty cent daguerreotypes have no longer any horror for him—their ghosts haunt him no more, for the terror their appearance produced has been allayed by the more powerful presence of the more mighty half dollar. *Medium* daguerreotypes flow from his establishment at fifty cents each.

—D. L. G. and others. We shall endeavor to correct those annoying failures, but so long as we have such a rascally postal system in the United States, we are fearful that our only method is to duplicate missing numbers, keep an account with Uncle Sam and charge to him all that is lost, and if he don't settle it peaceably sue him. We do not know that this plan has ever been tried to make him do his duty, but we do not see why he should not be made to pay for all articles entrusted to his care and which he loses, as well as express companies and transportation lines, particularly when in a large majority of cases these losses are owing to the carelessness, or dishonesty of his servants.

—It will be perceived by reference to our prospectus for 1854, on the cover, that the Journal after this year passes into the hands of the present editor exclusively. We would, therefore, request all indebted to the Photographic Art-Journal, to make immediate payment, in order to close the present concern. Address H. H. Snelling, Post Office Box No. 2200, or No. 298 Broadway. We trust that a repetition of this request will not be required. We have used our best exertions, and spent much time and money to place the Journal before our readers loaded with benefits

to the daguerrean artist, and we have sufficient confidence in their justness and appreciation of our labors to look for a prompt and willing response to our request, and we are happy in being able to say that with a very few exceptions our subscribers have been liberal and honest towards us. The few who have not been so, may possibly find their names handed down to posterity in a BLACK LIST.

PRODUCING THE POSITIVE PROOF.—Place the negative upon the lower glass of the pressure frame, put upon it a sheet of the positive paper—the prepared side upon the negative; then place above that, a sheet of black paper, and the second glass of the frame upon that; shut down the cover which exercises a slight pressure on the glasses to assure that the contact is perfect. Always take care to leave a border outside of the frame, both of the negative and positive paper, that you may judge of the action of the light. Expose the frame to the light of the sun in such a way, that the rays will fall perpendicularly upon the proof; you will judge of the progress by the border outside of the frame.

These are the different tints it will successively take;—greyish blue, neutral tint, violet-blue, indigo, black, bister-black, sepia, yellow-sepia, yellowish red, greenish grey, always more and more powerful.

When you arrive at the color you desire, you must stop the process: for example, to have the proof of a black tint after fixing with the hyposulphate, you must stop the process at the sepia color; and the parts which should form the whites, at the greyish blue, in order to repair the loss of color it sustains by the application of the hypo-bath.

You thus perceive you cannot fix the precise time for exposure to the light, as it depends upon the intensity of the negative, and the color of the proof you wish to obtain.



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